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MONTEREY, CALIFORNIA

**Standardized Verification, Validation, and Accreditation
(VV&A) Documentation Schema Description Document**

by

Curtis Blais

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ABSTRACT

The Department of Defense (DoD) Modeling and Simulation Steering Committee (M&S SC) is sponsoring several Acquisition Modeling and Simulation (M&S) Projects. One of those projects is titled, "Standardized Documentation for Verification, Validation, and Accreditation (VV&A)." Previous efforts defined standardized content and format requirements (i.e., templates) for four core VV&A documents, now codified in a new Military Standard (MIL-STD-3022) and associated Data Item Descriptions. A tool is under development to automate those templates to assist developers in creating standardized VV&A information across the DoD and Military Departments. In support of this effort, the Naval Postgraduate School was tasked to identify specific VV&A metadata that will enable the sharing of information across all communities enabled by M&S via the Global Information Grid (GIG) anywhere in the world and at anytime, and to formalize the structure and content of that metadata and the content of VV&A documents using the Extensible Markup Language (XML). This document describes the design of XML schemas defining the structure and content of standardized VV&A documentation and VV&A documentation project-level metadata.

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ACRONYMS AND ABBREVIATIONS

API	Application Programmer Interface
ASW	Anti-Submarine Warfare
CIO	Chief Information Officer
COI	Community of Interest
CDRL	Contract Data Requirements List
DDMS	DoD Discovery Metadata Specification
DID	Data Item Description
DISA	Defense Information Systems Agency
DMS	Discovery Metadata Specification
DoD	Department of Defense
DoDI	Department of Defense Instruction
DVDT	DoD VV&A Documentation Tool
GIG	Global Information Grid
GUI	Graphical User Interface
HTML	Hyper-Text Markup Language
M&S	Modeling and Simulation
M&S CO	Modeling and Simulation Coordination Office
MDA	Maritime Domain Awareness
MOVES	Modeling, Virtual Environments and Simulation
MSC DMS	M&S COI Discovery Metadata Specification
MSRR	M&S Resource Repository
NMSO	Navy Modeling and Simulation Office
NPS	Naval Postgraduate School
SISO	Simulation Interoperability Standards Organization
SME	Subject Matter Expert
SOA	Service Oriented Architecture
SOW	Statement of Work
SPAWAR	Space and Naval Warfare Command
SSC	SPAWAR Systems Command

URL	Uniform Resource Locator
V&V	Verification and Validation
VV&A	Verification, Validation and Accreditation
WWW	World Wide Web
W3C	World Wide Web Consortium
XML	Extensible Markup Language
XSLT	Extensible Stylesheet Language for Transformations

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EXECUTIVE SUMMARY

A collection of Extensible Markup Language (XML) schemas has been developed to support the DoD Verification, Validation, and Accreditation (VV&A) Documentation Tool (DVDT) project. The schemas include one for project-level metadata and one for each of the standard VV&A documents, namely: Accreditation Plan, V&V Plan, V&V Report, and Accreditation Report. The data structures are used to generate metadata conforming to the M&S Community of Interest Discovery Metadata Specification for enterprise discovery of VV&A information.

The current version of the schemas for standardized VV&A documentation provides a structural shell for storing content of the VV&A documents and provide the basis for generation of metadata supporting resource discovery in the Global Information Grid. Additional work is required to provide more precise restrictions on data content to assist the user in creating meaningful content. However, as currently defined, the schemas provide a basis for DVDT development. Future work will also explore specification and collection of stronger semantic descriptions of VV&A information to enable more effective search and automated reasoning with that information.

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I. INTRODUCTION

A. BACKGROUND

The Department of Defense (DoD) Modeling and Simulation Steering Committee (M&S SC) Acquisition M&S Community Lead, Mr. Chris DiPetto, Deputy Director for Developmental Test and Evaluation, is sponsoring several Acquisition Modeling and Simulation (M&S) Projects. One of those projects is titled, "Standardized Documentation for Verification, Validation, and Accreditation (VV&A)." Previous efforts defined standardized content and format requirements (i.e., templates) for four core VV&A documents (Department of Defense, 2008). The current effort is developing a Graphical User Interface (GUI) and software logic to automate those templates to assist developers in creating standardized VV&A information across the DoD and Military Departments. This effort includes identification of specific VV&A metadata that will enable the sharing of information across all communities enabled by M&S via the Global Information Grid (GIG) anywhere in the world and at anytime. The work addresses policy and technology gaps previously identified by the M&S SC in their Common and Cross-Cutting Business Plan (Modeling and Simulation Steering Committee, 2006) in addition to objectives from the DoD Acquisition M&S Master Plan (DoD, 2006).

Using models and simulations that provide credible results in the systems engineering process is crucial to fielding defense weapon systems more effectively to the warfighter. Employing distributed, live-virtual-constructive synthetic environments that produce results that can be used with confidence is essential to support development and testing of interoperable systems for joint capabilities. Confidence in the use of M&S results can be achieved only through the implementation of standard VV&A processes that are understood and employed by the M&S communities. M&S is a key enabler for systems engineers throughout the acquisition process. VV&A is critical for ensuring an M&S is correct, is used correctly, and can produce results a systems engineer can trust.

DoD Instruction (DoDI) 5000.61 (DoD, 2003) sets policy requiring accreditation of all models and simulations "used to support major DoD decision-making organizations and processes" and all models and simulations "used to support joint training and joint

exercises.” The Instruction requires DoD components to “establish VV&A policies and procedures for models and simulations they develop, use, or manage.” Moreover, the Instruction requires Principal Staff Assistants and heads of the DoD Components to hold M&S proponents accountable and responsible for “verification and validation of their assigned M&S, as well as the documentation of those activities,” and to hold individual data producers accountable and responsible for “the quality of their data or data products provided for M&S use.”

Since 1996 when DoDI 5000.61 was first promulgated, organizations DoD-wide have been attempting to implement VV&A processes and capture VV&A information. Over the years, guidance for implementing VV&A was provided in the form of Service- and organizational-level instructions, recommended practices, guidebooks, handbooks, and standards. The requirements for documenting VV&A information varied from Service-to-Service, organization-to-organization, and community-to-community, but generally all required the same types of information needed to gain confidence in the application of M&S results for an intended use. Because there were common general requirements, the Service VV&A representatives came together in 2005 as part of a DoD-sponsored VV&A Templates Tiger Team to begin work on developing one set of templates for four core VV&A documents: the Accreditation Plan, V&V Plan, V&V Report, and the Accreditation Report. The purpose was to enable expanded M&S reuse by building the foundation for consistent V&V information to support accreditation decisions. The result of that effort is a DoD Standard Practice, available as MIL-STD-3022, that provides a common framework for the sharing of information throughout the VV&A process. The templates captured in the standard practice will be automated by the DoD VV&A Documentation Tool (DVDT). Using templates with standard format and content requirements to document VV&A information across DoD will help users better understand if an M&S can meet their needs because they will know what kind of information is available and where to look in the document for that information. The standard include Data Item Descriptions that can be included in contract procurement packages to ensure conformance to these practices.

B. PURPOSE

This document describes the design of XML schemas defining the structure and content of (1) standardized VV&A documentation and (2) project-level and document-level metadata used to publish information about the VV&A documents. The work includes instructions for generating metadata conforming to the M&S Community of Interest Discovery Metadata Specification (MSC-DMS, version 1.1) (Modeling & Simulation Coordination Office, 2008).

C. APPROACH

The DoD Standardized VV&A Templates describe standard content for the Accreditation Plan, Accreditation Report, V&V Plan, and V&V Report. Some portions of these documents are common (e.g., Problem Statement) and can be entered once by document producers for use in generating initial content in subsequent documents for a project. Some portions have common structure (e.g., document title page), even if the actual content across the documents may differ. Information structures that are *common* (common content or common structure) to two or more of the standard document templates can be described in a single XML schema document for use in schemas representing each individual document. Four other XML schema documents can be developed for each of the four standard document templates, using declarations from the common set and adding XML declarations for structure and content specific to each VV&A document as needed. A sixth XML schema can describe VV&A project-level metadata for saving overarching project information. This approach is summarized in Figure 1 (project-level metadata) and Figure 2 (document-level metadata and document content files) and further discussed below.

The DVDT will be used by developers and other M&S professionals (identified as “Producer” in the diagrams) to create VV&A documentation in accordance with the standard templates. An initial set of metadata describing the VV&A documentation project will be extracted and published to an M&S repository to support information discovery (Figure 1). Additionally, information in the VV&A documents will be stored in XML files enabling various applications to be able to access and use that information. For example, Hyper-Text Markup Language (HTML) documents can be generated from

the content of the XML documents to provide information summaries on web pages or XML query engines can search the XML documents for planned VV&A activities on a particular M&S resource. XML provides an application-independent structure for the VV&A document content. Metadata describing each of the VV&A documents can be extracted from the XML files to produce documents conforming to the MSC-DMS schema. The purpose of the MSC-DMS is to standardize on the set of metadata used to describe resources in Modeling and Simulation Resource Repository (MSRR) nodes (or, more generically, an M&S Resource Registry Domain, as indicated in the diagram) and similar applications, and to ensure that the product metadata template will align with the DoD Discovery Metadata Specification (DDMS) as part of the Global Information Grid (GIG) Net-Centric Data Sharing Strategy.

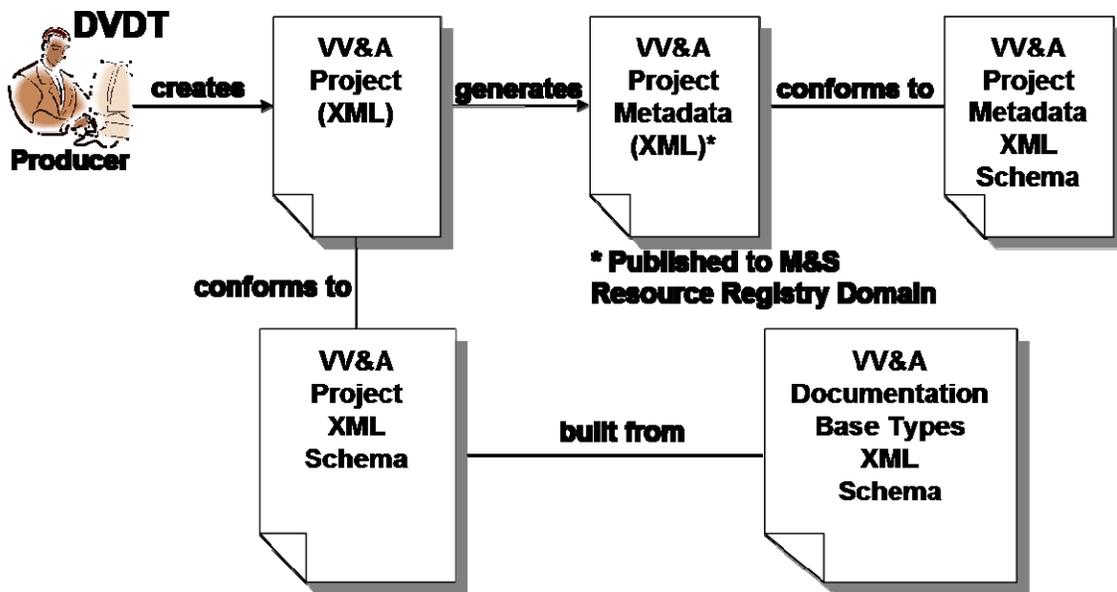


Figure 1. XML Schema documents describe the structure and content of the VV&A documentation project-level information, including metadata for posting to the Global Information Grid.

The structure and content of the XML representation of each VV&A document produced by the DVDT will conform to an XML schema appropriate to the kind of VV&A document produced, as shown in Figure 2. That is, if an Accreditation Plan is produced, the XML representation of that information will conform to the XML schema

describing the structure and content of the Accreditation Plan. The same is true for the other three documents (V&V Plan, V&V Report, and Accreditation Report); each XML document created using the DVDT will conform to its respective XML schema document.

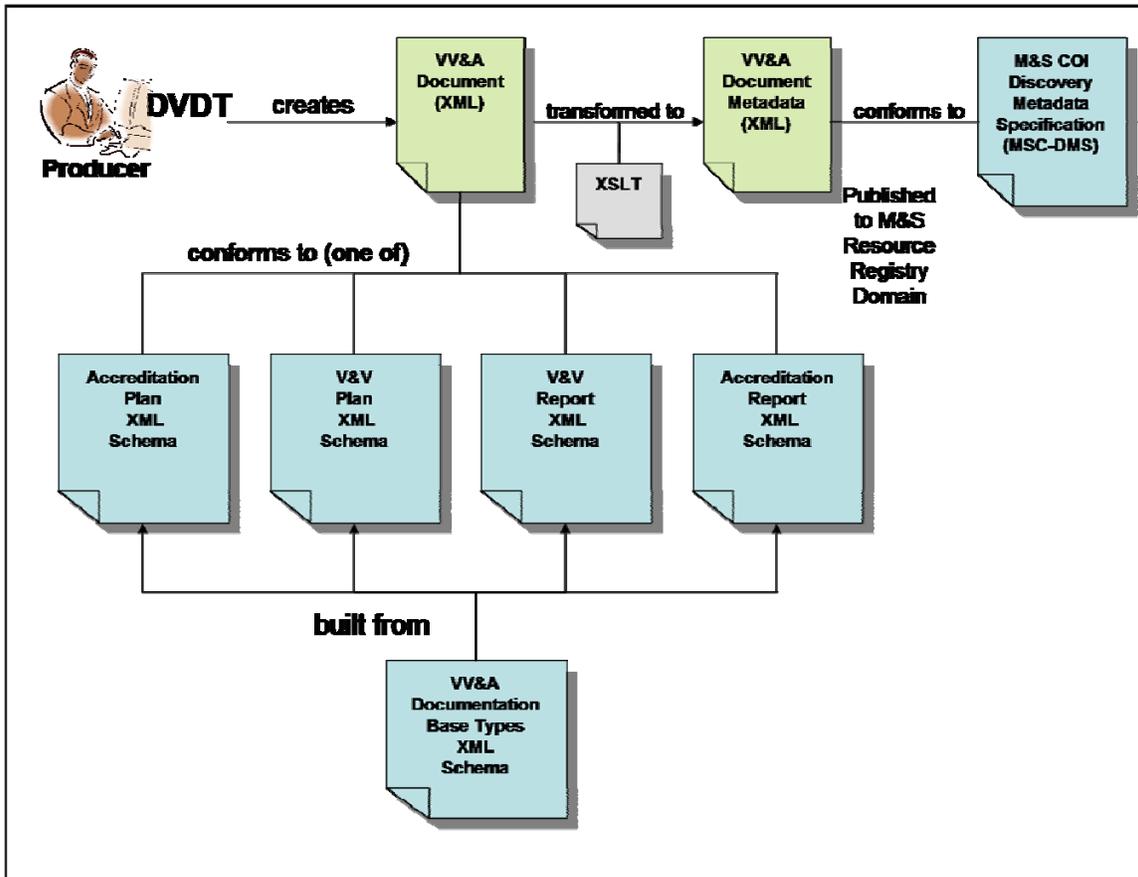


Figure 2. XML Schema documents describe the structure and content of the standard VV&A documentation templates as well as metadata for posting to the Global Information Grid.

Much of the information in the VV&A document templates is similar in structure and content. For example, all four documents have a title page consisting of a particular collection of information, all four documents have a Problem Statement, and the V&V Plan and V&V Report share a V&V Scope. Such common information structures can be described in a single XML schema, identified in the diagrams as the VV&A Documentation Base Types XML schema. Data structures defined in this schema are then used by reference in the VV&A document-specific schemas. The document-specific

schemas add other data structures specific to the document structure being described. The document-specific schemas, together with the base types schema, define data structures for the full information content of the respective standard VV&A templates, as will be shown later in this document.

The schemas do not attempt to capture template information that is considered to be indicative of *presentation* style, rather than the actual information *content*. For example, the schemas can describe the information that would be used to populate the Accreditation Scope section of the VV&A documents, but the schemas will not provide a data structure for indicating that this section is numbered 1.4 in the standard templates. In this example, the section numbering relates to one approach to *presenting* the information; it is not part of the VV&A information itself. Separation of *presentation* from *content* is a fundamental precept in the effective use of XML for information storage and processing (Hoskinson, 1999).

Returning to the discussion of Figure 2, and continuing with the flow from left to right across the top of the diagram, a portion of the information provided in each VV&A document is extracted to produce a set of metadata describing the document (labeled VV&A Document Metadata in the diagram). That extraction can be performed using the Extensible Stylesheet Language Transformations (XSLT) (World Wide Web Consortium, 2007), as indicated in the diagram, or by other processing mechanisms. The metadata document will conform to a separate XML schema, identified in the diagram as the MSC-DMS XML schema. This schema describes the set of metadata that will be posted to M&S resource registries or other network sites to facilitate discovery of information about VV&A documents. Recognizing the current Department of Defense evolution toward the Global Information Grid, the schema design for the VV&A document metadata set addresses requirements from the DoD Discovery Metadata Specification (DoD, 2007) and the MSC-DMS (Modeling & Simulation Coordination Office, 2008).

All XML schemas discussed above are described in detail in this document. The XML schemas developed for this project conform to the W3C XML Schema recommendation (World Wide Web Consortium, 2004).

D. DOCUMENT CONTENT

Section I provides an introduction to the VV&A Standardized Documentation project, giving background information identifying the sponsor and participating organizations. The Introduction gives the purpose of the design document and the XML schema design approach, as well as a description of the content of this document. Section II describes VV&A documentation project-level information that will be entered into the DVDT before the tool enables a Producer to download the set of standard VV&A document templates. The project-level metadata supports the information needed by the MSC-DMS for discovery of information about a VV&A documentation project. Section III describes the XML schema for base types that can be used in describing structure and content of the four VV&A documents. Section III also provides detailed descriptions of the four document-specific XML schemas. Section IV describes the extraction of project-level and document-level metadata to produce discovery metadata conforming to the MSC-DMS schema. Section V gives recommendations for follow-on work and provides a summary of the document. The appendixes provide the full text of the XML schema files. The document concludes with a list of references and an initial distribution list for individuals and organizations receiving this document.

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II. VV&A DOCUMENTATION PROJECT-LEVEL METADATA SCHEMA DESIGN

A. INTRODUCTION

This chapter provides a brief overview of the DoD Discovery Metadata Specification (DDMS) and the M&S Community of Interest Discovery Metadata Specification (MSC-DMS) prior to describing the XML schema for specifying the structure and content of VV&A documentation project-level metadata. The metadata specifications provide a standard means of describing information resources to promote search and discovery across the DoD Enterprise. The design of the VV&A documentation project-level (and document-level) metadata needs to ensure that sufficient metadata is recorded to enable generation of metadata files conforming to these specifications.

B. DOD DISCOVERY METADATA SPECIFICATION

Recent policy decisions are driving significant efforts to revolutionize data sharing across the US Government. Many of these are the result of presidential directives addressing protection of critical infrastructure and the ability to share information across agencies in times of national disaster. In the US Department of Defense, including DoD intelligence agencies and functions, the guiding document for information sharing is the Net-Centric Data Sharing Strategy (DoD Chief Information Officer, 2003). The document defines net-centricity as “the realization of a networked environment, including infrastructure, systems, processes, and people, that enables a completely different approach to warfighting and business operations” (*ibid*, p 1). The network foundation is the Global Information Grid, “the globally interconnected, end-to-end set of information capabilities, associated processes, and personnel for collecting, processing, storing, disseminating, and managing information on demand to warfighters, defense policymakers, and support personnel” (*ibid*, p 1). Data assets addressed by the strategy include system files, databases, documents, official electronic records, images, audio files, web sites, and data access services. Users and applications can search for and “pull” data as needed, or can receive alerts when data to which they have subscribed is updated or changed (publish/subscribe). The goals of the strategy are to make data (*ibid*, p 10):

- visible – users and applications can discover the data assets
- accessible – users and applications can obtain the data assets
- institutionalized – data approaches are incorporated into DoD process and practices
- understandable – users and applications can comprehend the data, both structurally and semantically, to address specific needs
- trusted – users and applications can determine the authority of the source of the data assets
- interoperable – metadata is available to allow mediation or translation of data to support many-to-many exchanges of data
- responsive to user needs – mechanisms for improvement through continual feedback are supported to address particular perspectives of data users

The data sharing strategy is being addressed through (1) self-organized Communities of Interest (COIs) for identification and maintenance of data; (2) metadata describing the data assets; and (3) GIG Enterprise Services supporting data tagging, sharing, searching, and retrieval. For example, in the Department of the Navy, numerous COIs have formed in recent years, including Anti-Submarine Warfare (ASW), Maritime Domain Awareness (MDA), Mine Warfare, and Service Oriented Architecture (SOA) Transformation Group. The Department of Defense has established a Modeling and Simulation COI, among others.

In the data sharing strategy, data assets are described by metadata to support discovery by users and applications. A standard set of metadata for discovering distributed resources is provided in the DoD Discovery Metadata Specification (DDMS) (DoD, 2007). The DDMS states:

Data assets available on the Enterprise must be described with metadata, using the information elements defined in this document to permit discovery through the Enterprise Discovery capability. The DDMS defines a core set of elements that must be used to describe assets made visible to the Enterprise. Users (human and systems) that search the Enterprise will discover data assets that have been tagged and entered into catalogs or repositories that respond to search queries specified in terms of DDMS entries. (*ibid*, pp 16-17)

The M&S community, as with other repository efforts, can readily address this directive by ensuring that sufficient metadata are provided in descriptions of assets to allow generation of at least the minimum required set of metadata specified in the DDMS. The concept for use of DDMS for asset discovery is shown in Figure 3.

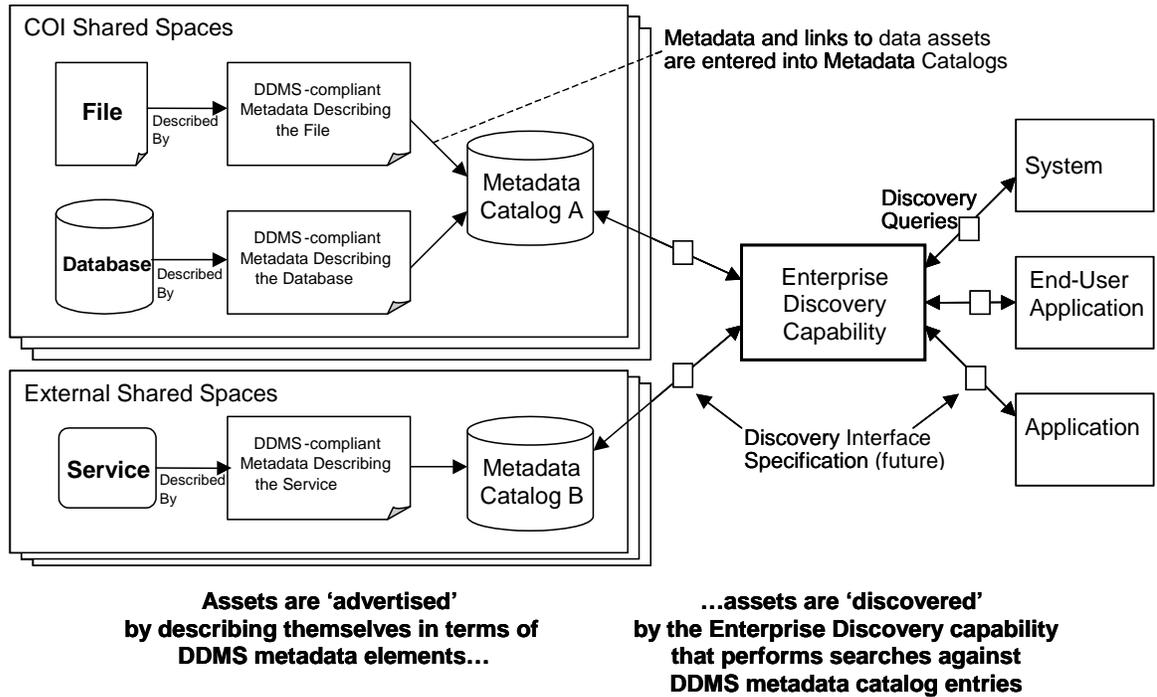


Figure 3. DDMS Usage Concept (DoD, 2007, p 19)

The requirement to support DDMS does not preclude using more sophisticated and domain-centric metadata to describe M&S resources. It simply defines a minimum level of standardized metadata that will be supported by GIG Enterprise Services. In fact, the DDMS design reflects a combination of a core layer of metadata with an extensible layer providing COI/domain-specific metadata, as shown in Figure 4. The Summary Content Category Set of the DDMS is specifically aimed at providing “content-related” details about data assets. Content metadata provides topics, keywords, context, and other content-related information; gives users and applications insight into the meaning and context of the data; and provides a basis for search engines to perform searches for data assets that address specific topics (DoD Chief Information Officer, 2003, p 15).

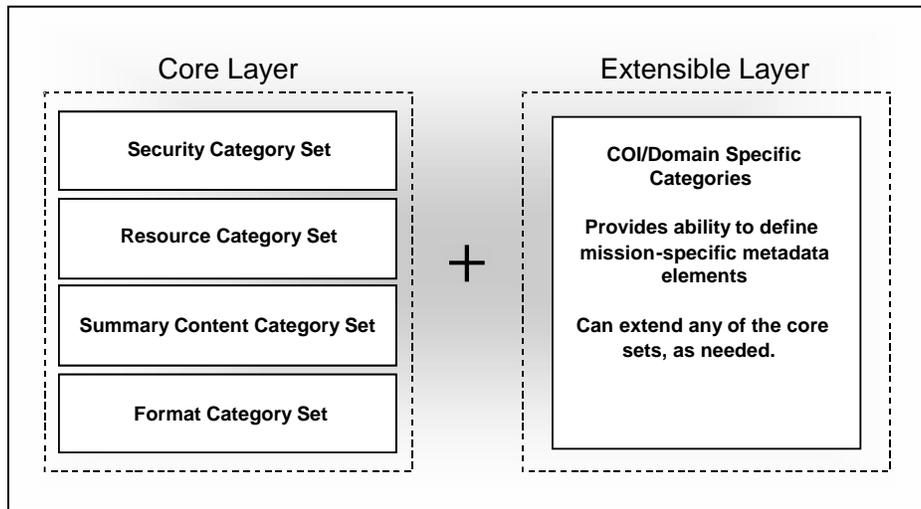


Figure 4. DDMS Logical Model consisting of a Core Layer and a COI/Domain Specific Extensible Layer (DoD, 2007, p 21)

The GIG will provide a number of core enterprise services, including Discovery, Messaging, User Assistant, Information Assurance / Security, Enterprise Service Management, Storage, Mediation, Collaboration, and Application. As these GIG services become available, it will be advantageous communities such as the M&S COI to be able to employ these services. By using the common infrastructure, M&S resources will be made available to the broad DoD community through the standardized practices.

GIG Enterprise Services also include the DoD Metadata Registry (MDR). This registry, based on the International Organization for Standardization (ISO) 11179 specification for metadata registries, is available throughout the Enterprise. The Registry represents a “one-stop shop for developer data needs” and is a key component in achieving the Department’s interoperability goals:

All document formats, interface definitions, and exchange models used by systems will be stored in the DoD Metadata Registry. Developers can discover these metadata assets and utilize them to read, write, or exchange data that is made available throughout the Enterprise. All programs and COIs have a responsibility to support interoperability through active participation in the DoD Metadata Registry. The DoD Metadata Registry will provide capabilities to further support interoperability through the use of translation and mediation services and for the sharing and reuse of processes. (DoD Chief Information Officer, 2003, p 8)

The Net-Centric Data Sharing Strategy directs COIs to take the lead in establishing COI-specific metadata structures, defining community ontologies, cataloging data and metadata, and having members post data. A *community ontology* “provides the data categorization, thesaurus, key words, and/or taxonomy” that can be used to “increase semantic understanding and interoperability of the community data” (*ibid*, pp 5-6). Taxonomies “enhance discovery by providing a hierarchical means of searching for data while providing users and applications with additional insights about data assets by indicating their placement among other data assets” (*ibid*, p 15). Furthermore, COI-developed vocabularies will define terms used in describing data assets, and the thesauruses will identify related terms to assist translation services. When approved for release, the VV&A documentation schemas described in this report will be made available to the DoD Enterprise through the MDR.

C. DOD M&S COI DISCOVERY METADATA SPECIFICATION

The DoD Modeling and Simulation (M&S) COI has defined a set of metadata for discovery of assets based on the DDMS. The metadata structure and content are specified in the MSC-DMS (Modeling & Simulation Coordination Office, 2008). An overview of the structure is shown in Figure 5.¹ The root element of the XML structure is Resource. This is defined in the MSC-DMS schema as a complex type (possesses child elements), resourceType, defined as a sequence of child elements with an id attribute for indicating a unique identifier for the resource. M&S resources are considered to include, but not be limited to M&S software, adjunct tools (e.g., data loggers), federations of simulations, M&S software components, M&S services, M&S data, M&S data models, interface specifications, and M&S software design documents. The child elements include the following (refer to the specification for a full description of the XML schema design):

- Title – This element holds title information assigned to the resource. A resource may not only be identified by a title value, but also by a subtitle, acronym, or document number.

¹ Portions of the diagram shown in dashed white boxes are optional elements in the XML data structure.

- Type – This element specifies the type of resource, and also describes the nature, genre, or discipline of the content of the resource.
- Description – This element provides a description of the resource.
- Dates – This element provides one or more calendar dates associated with an event in the life cycle of the resource.
- Version – This element specifies the version identification assigned to the resource.
- Rights – This element provides information about rights held in and over the resource.
- Releasability – This element provides information about the releasability of information about the resource.
- Security – This element provides information about the security classification associated with the resource.
- Associations – This element specifies references to original source material used to develop or derive the resource.
- POCs – This element specifies organizations and/or persons who have a particular role with respect to the resource.
- Keywords – This element specifies keywords attributed to the resource.
- Usages – This element specifies information about usages pertaining to the resource.
- Media – This element specifies information about the media pertaining to the resource.
- Glyph – This element specifies an image that can be used to visually represent a resource.
- Extensions – This element specifies various extensions that can be added to the core M&S resource metadata. An initial set of extensions for VV&A coverage has been identified in the specification to support

description of a VV&A documentation project as well as individual VV&A documents produced by a project. The metadata elements include: type of M&S resource (i.e., “VV&A Documentation,” with sub-type for the specific document type); intended use; executive summary; and POC for VV&A information.

D. PROJECT-LEVEL METADATA SCHEMA DESIGN

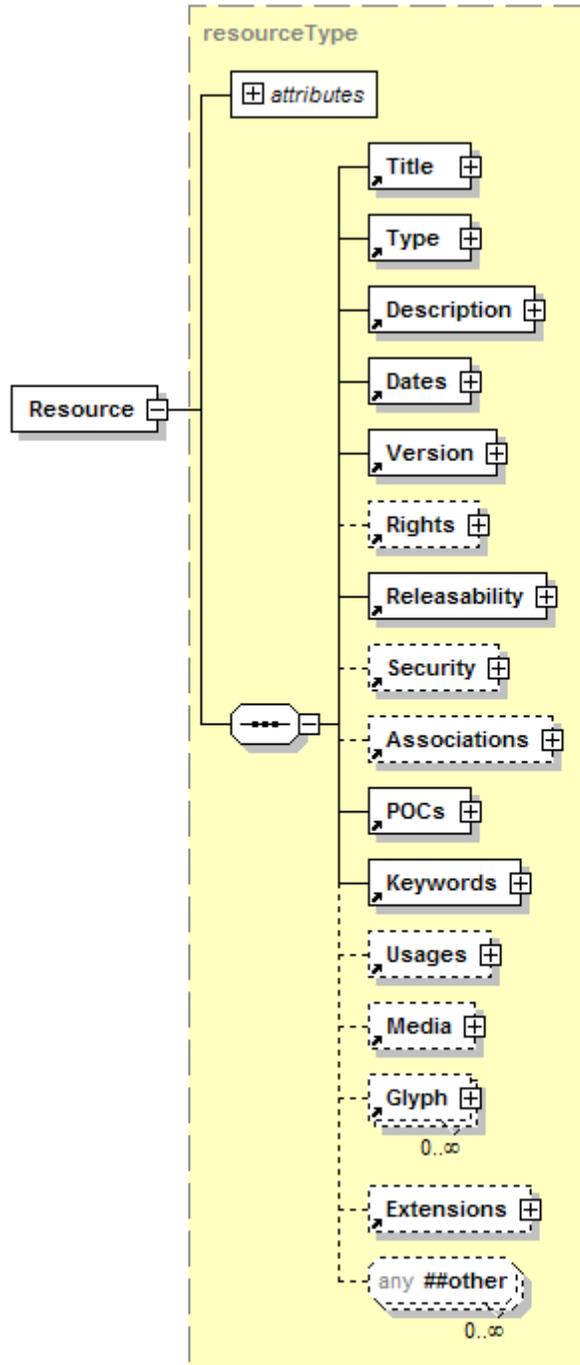
As discussed earlier, Government programs today are directed to share information to promote greater coordination and efficiency. To support this practice, the DVDT will require the Producer (of VV&A documentation) to enter a minimal set of information about the VV&A documentation project being undertaken. A key operational concept is to minimize the information the Producer is required to enter before being able to obtain the VV&A document templates.

Information to be entered by the Producer consists of the following:

- Project Title – mandatory string entry, with optional subtitle, acronym, and documentNumber
- Project Description – mandatory string entry providing a brief description of the VV&A project
- Sponsor – optional entry of information about the sponsor person or organization
- Points of Contact – entry of information on one or more humans or organizations from which others could obtain additional information about the VV&A documentation project

In addition to information entered by the Producer, the tool will automatically provide the following:

- Project Reference ID – mandatory string entry providing a unique identifier for this set of project-level information (note: precise format of the Project Reference ID is to be determined during software development)
- Project Type – automatically set to “VV&A documentation”
- Project Version – automatically set to “NA” (not applicable)
- Submitter – information about the person entering the data, automatically derived from user registration data
- Submission Date – automatically set to current date and time of the metadata submission action



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Figure 5. Top-Level Structure of the MSC-DMS XML Schema

The XML structure for the project-level metadata is defined in the VVADocumentationProjectMetadata XML schema and shown in Figure 6. Components of this structure are described in detail below.

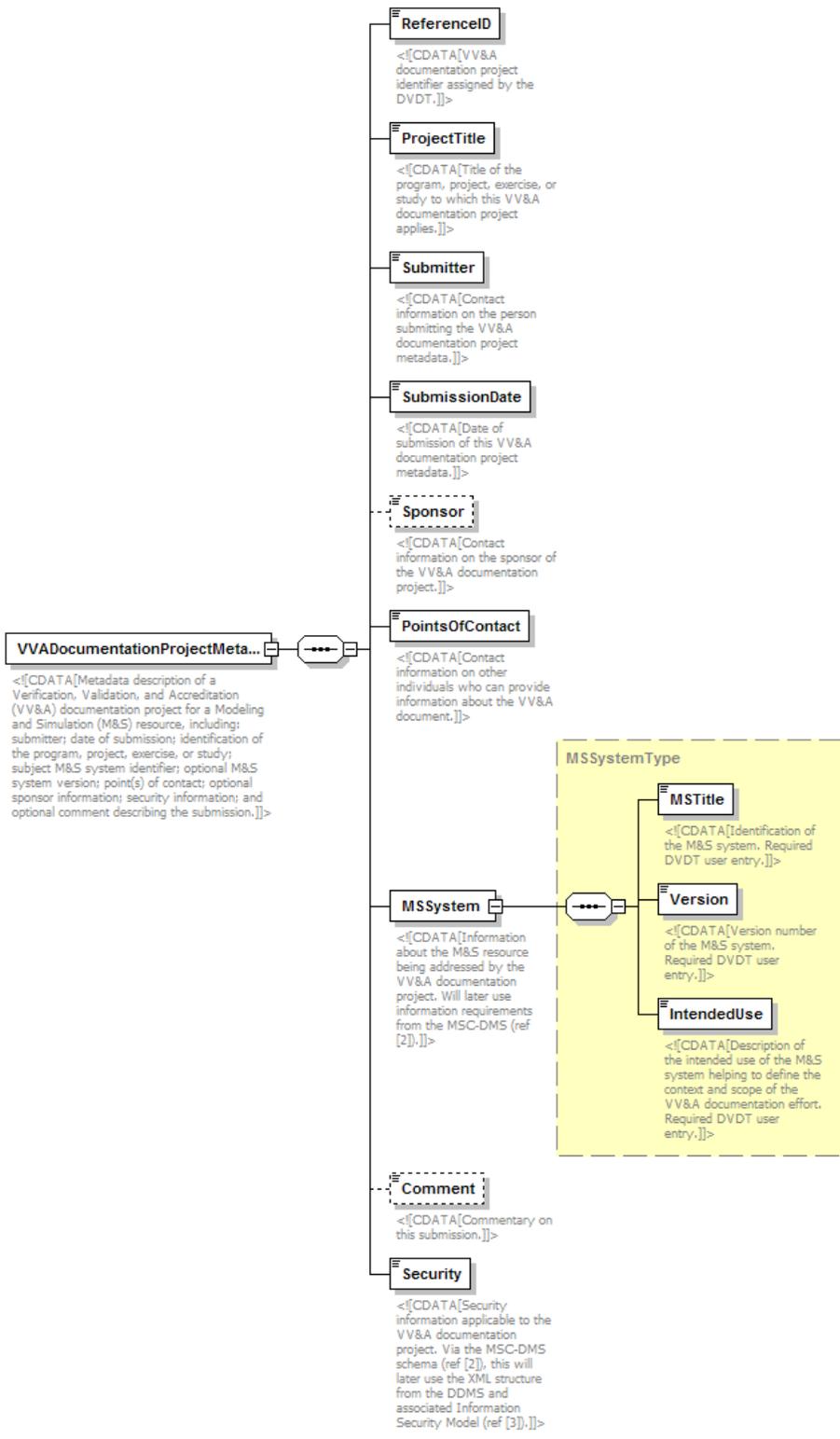


Figure 6. Top-Level Structure of the VV&A Documentation Project-Level Metadata XML Schema

The root element of the XML structure is VVADocumentationProjectMetadata. This is defined as a complex type consisting of a sequence of the following child elements:

- ReferenceID – This element is a unique identifier assigned to the VV&A documentation project by the DVDT registration software. It allows text entry (XML Schema built-in xs:string data type).
- ProjectTitle – This element is the title of the program, project, exercise, or study to which this VV&A documentation project applies. It allows text entry (xs:string).
- Submitter – This element provides contact information on the person submitting the VV&A documentation project. It allows text entry (xs:string).
- SubmissionDate – This element provides the date of submission of this VV&A documentation project metadata. It allows text entry (xs:string).
- Sponsor – This optional element provides contact information on the sponsor of the VV&A documentation project. It allows text entry (xs:string).
- PointsOfContact - -This element provides contact information on other individuals who can provide information about the VV&A document. It allows text entry (xs:string).
- MSSystem – This element provides information about the M&S resource being addressed by the VV&A documentation project. The structure is defined in the VVADocumentationProjectMetadata schema by MSSystemType, a complex type defined in the VVADocumentationBaseTypes schema as a sequence of the following child elements:
 - MSTitle – This element identifies the M&S system. It allows text entry (xs:string).

- Version – This element identifies the version number of the subject M&S system. It allows text entry (xs:string).
- IntendedUse – This element describes the intended use of the M&S system to help define the context and scope of the VV&A documentation project.
- Comment – This optional element contains any additional commentary the submitter chooses to enter to describe the VV&A documentation project. It allows text entry (xs:string).
- Security – This element provides security information (e.g., classification) associated with this VV&A documentation project. It allows text entry (xs:string).

E. SUMMARY

This chapter provided an overview of governing metadata standards for DoD M&S resources and described the initial project-level metadata collected when a producer of VV&A documents registers to download the DVDT templates and provides information about the planned VV&A documentation project.

III. VV&A DOCUMENT TEMPLATES SCHEMA DESIGN

A. INTRODUCTION

This chapter describes the design of XML schemas for storing the content of standardized VV&A documentation. The chapter discusses the technical challenges that need to be addressed to create a workable schema design, presenting design trade-offs and decisions made. Five XML schemas are described: one containing data declarations for information that is contained in two or more of the VV&A documents and four schemas describing the VV&A document content, one for each of the four standard documents (Accreditation Plan, V&V Plan, V&V Report, and Accreditation Report).

B. XML DESIGN CONSIDERATIONS

The purpose of the XML schemas described in this section is to define the structure and content of XML documents that store information from the standard VV&A document templates. The major challenge in the design of the schemas is the need to evolve from the free-text narrative content of traditional documentation to more precise data content in XML files. In addition, information that has traditionally been documented in lists or tables needs to be expressed very explicitly in XML structures, from which the content in the lists or tables can be constructed for a particular presentation of the data (such as in a written report). The decision to move toward more precise description of the document content leads to specification of information elements from which the narrative content can be constructed.

C. VV&A DOCUMENT COMMON DATA STRUCTURES AND CONTENT

Table 1 provides a comparison of the information elements contained in the standardized VV&A document templates. Common elements are aligned in the table structure. Information specific to a particular VV&A document is shown in its own row of the table (note: common color coding indicates similarity in data structure and content).

Table 1. Comparison of Information Elements from the Standard VV&A Document Templates

Accreditation Plan	V&V Plan	V&V Report	Accreditation Report
Title Page	Title Page	Title Page	Title Page
- Date	- Date	- Date	- Date
- Id of program, project, exercise, or study	- Id of program, project, exercise, or study	- Id of program, project, exercise, or study	- Id of program, project, exercise, or study
- Id of sponsoring organization or program manager	- Id of sponsoring organization or program manager	- Id of sponsoring organization or program manager	- Id of sponsoring organization or program manager
- Document title -- M&S name -- M&S version -- Doc type -- Doc version	- Document title -- M&S name -- M&S version -- Doc type -- Doc version	- Document title -- M&S name -- M&S version -- Doc type -- Doc version	- Document title -- M&S name -- M&S version -- Doc type -- Doc version
- Id of document preparer -- Lead Investigator -- Organization -- Contract	- Id of document preparer -- Lead Investigator -- Organization -- Contract	- Id of document preparer -- Lead Investigator -- Organization -- Contract	- Id of document preparer -- Lead Investigator -- Organization -- Contract
- Distribution statement	- Distribution statement	- Distribution statement	- Distribution statement
- Classification (if required)			
1 Problem statement	1 Problem statement	1 Problem statement	1 Problem statement
1.1 Intended use	1.1 Intended use	1.1 Intended use	1.1 Intended use
1.2 M&S overview	1.2 M&S overview	1.2 M&S overview	1.2 M&S overview
1.3 M&S application	1.3 M&S application	1.3 M&S application	1.3 M&S application
1.4 Accreditation scope	1.4 Accreditation scope	1.4 Accreditation scope	1.4 Accreditation scope
	1.5 V&V scope	1.5 V&V scope	
2 M&S requirements and acceptability criteria			
- requirement	- requirement	- requirement	- requirement
- acceptability criteria (many to one)			
- quantitative metric	- quantitative metric	- quantitative metric	- quantitative metric
- qualitative metric	- qualitative metric	- qualitative metric	- qualitative metric
- disposition or	- disposition or	- disposition or	- disposition or

Accreditation Plan	V&V Plan	V&V Report	Accreditation Report
assessment	assessment	assessment	assessment
- priority	- priority	- priority	- priority
3 M&S assumptions	3 M&S assumptions	3 M&S assumptions	3 M&S assumptions
3.1 Assumptions	3.1 Assumptions	3.1 Assumptions	3.1 Assumptions
3.2 Capabilities	3.2 Capabilities	3.2 Capabilities	3.2 Capabilities
3.3 Limitations	3.3 Limitations	3.3 Limitations	3.3 Limitations
3.4 Risks/Impacts	3.4 Risks/Impacts	3.4 Risks/Impacts	3.4 Risks/Impacts
4 Accreditation methodology	4 V&V methodology	4 V&V task analysis	4 Accreditation assessment
4.1 Accreditation information needs	4.1 Planned data V&V tasks/activities	4.1 Data V&V task analysis	4.1 Accreditation information needs
4.2 Information collection plan	4.1.1 Data verification tasks/activities	4.1.1 Data verification task analysis	4.2 Information collection
4.3 Assessment plan	4.1.2 Data validation tasks/activities	4.1.2 Data validation task analysis	4.3 Assessment
	4.1.3 Required validation data		
	4.2 Planned conceptual model validation tasks/activities	4.2 Conceptual model validation task analysis	
	4.3 Planned design verification tasks/activities	4.3 Design verification task analysis	
	4.4 Planned implementation verification tasks/activities	4.4 Implementation verification task analysis	
	4.5 Planned results validation tasks/activities	4.5 Results validation task analysis	
	4.6 Planned V&V reporting tasks/activities	4.6 V&V reporting task analysis	
5 Accreditation issues	5 V&V issues	5 V&V recommendations	5 Accreditation recommendations
6 Key participants	6 Key participants	6 Key participants	6 Key participants
6.1 Accreditation participants	6.1 Accreditation participants	6.1 Accreditation participants	6.1 Accreditation participants
6.2 V&V	6.2 V&V	6.2 V&V	6.2 V&V

Accreditation Plan	V&V Plan	V&V Report	Accreditation Report
participants	participants	participants	participants
6.3 Other participants	6.3 Other participants	6.3 Other participants	6.3 Other participants
7 Planned accreditation resources	7 Planned V&V Resources	7 Actual V&V Resources	7 Actual accreditation resources
7.1 Resource allocations	7.1 Planned V&V tasking and funding	7.1 V&V tasking and funding	7.1 Resource allocations
7.2 Accreditation milestones and timeline	7.2 Planned V&V timeline	7.2 V&V timeline	7.2 Accreditation milestones and timeline
		8 V&V lessons learned	
Appendices	Appendices	Appendices	Appendices
A M&S description	A M&S description	A M&S description	A M&S description
A.1 Overview	A.1 Overview	A.1 Overview	A.1 Overview
A.2 Development and structure	A.2 Development and structure	A.2 Development and structure	A.2 Development and structure
A.3 Capabilities and limitations	A.3 Capabilities and limitations	A.3 Capabilities and limitations	A.3 Capabilities and limitations
A.4 Use history	A.4 Use history	A.4 Use history	A.4 Use history
A.5 Data	A.5 Data	A.5 Data	A.5 Data
A.5.1 Input data	A.5.1 Input data	A.5.1 Input data	A.5.1 Input data
A.5.2 Output data	A.5.2 Output data	A.5.2 Output data	A.5.2 Output data
A.6 Configuration management	A.6 Configuration management	A.6 Configuration management	A.6 Configuration management
B M&S requirements traceability matrix	B M&S requirements traceability matrix	B M&S requirements traceability matrix	B M&S requirements traceability matrix
C Basis of comparison	C Basis of comparison	C Basis of comparison	C Basis of comparison
D References	D References	D References	D References
E Acronyms	E Acronyms	E Acronyms	E Acronyms
F Glossary	F Glossary	F Glossary	F Glossary
G Accreditation programmatics	G V&V programmatics	G V&V programmatics	G Accreditation programmatics
H Distribution list	H Distribution list	H Distribution list	H Distribution list
	I Accreditation plan	I V&V plan	I Accreditation plan
		J Test information	J V&V report

Information elements used in more than one VV&A document are described in the VVADocumentationBaseTypes XML schema file. This schema declares a number of complex data types (called a “complexType” in the XML Schema language) for the structure and content of the common elements. Other XML schema files can import this set of common declarations and use those structures to create content particular to the document in question. For example, the schema for describing an Accreditation Plan XML document uses these defined common types to declare structures for the Accreditation Plan. Consider the following excerpt from the VVADocumentationBaseTypes schema:

```
<xs:complexType name="DocumentTitleType">
  <xs:annotation>
    <xs:documentation>Title page information for the
document.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="Date"/>
    <xs:element name="ProgramIdentification"/>
    <xs:element name="Sponsor" type="SponsorType"/>
    <xs:element name="Title" type="TitleType"/>
    <xs:element name="Preparer" type="PerformerType"/>
    <xs:element name="Distribution"/>
    <xs:element name="Classification"/>
  </xs:sequence>
</xs:complexType>
```

This declares a complexType called DocumentTitleType consisting of a subordinate structure consisting of a sequence of child elements (Date, ProgramIdentification, Sponsor, etc.). Some of these elements in turn are declared as named data types defined in the VVADocumentationBaseTypes schema (SponsorType, TitleType, PerformerType).

As we will see, the AccreditationPlan schema has the following declarations:

```
<xs:element name="AccreditationPlan">
  <xs:annotation>
    <xs:documentation>Standard content of an
Accreditation Plan. The Accreditation Plan defines the criteria to be
used during the accreditation assessment; defines the methodology to
conduct the accreditation assessment; defines the resources needed to
perform the accreditation assessment; and identifies issues associated
with performing the accreditation assessment.</xs:documentation>
  </xs:annotation>
  <xs:complexType>
    <xs:sequence>
```

```
<xs:element name="DocumentTitle"
type="DocumentTitleType"/>
```

Here, the first element in the AccreditationPlan is called DocumentTitle and is declared to be of type DocumentTitleType which was defined above in the VVADocumentationBaseTypes schema. An XML document containing Accreditation Plan data according to the Accreditation Plan schema structure would begin as follows:

```
<AccreditationPlan
xsi:schemaLocation="http://metadata.dod.mil/mdr/ns/VVADocumentation
AccreditationPlanv0.11.xsd"
xmlns="http://metadata.dod.mil/mdr/ns/VVADocumentation"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <DocumentTitle>
    <Date>text</Date>
    <ProgramIdentification>text</ProgramIdentification>
    <Sponsor>
      <SponsorOrganization>text</SponsorOrganization>
    </Sponsor>
    <Title>
      <MSName>text</MSName>
      <MSVersion>text</MSVersion>
      <DocType>text</DocType>
      <DocVersion>text</DocVersion>
    </Title>
    <Preparer>
      <Name>text</Name>
      <Organization>text</Organization>
      <Contract>text</Contract>
    </Preparer>
    <Distribution>text</Distribution>
    <Classification>text</Classification>
  </DocumentTitle>
```

As shown, the DocumentTitle element in this AccreditationPlan XML document excerpt has the full structure of the DocumentTitleType complexType declared in the VVADocumentationBaseTypes XML schema.

Sections D, E, F, and G of this chapter describe the XML schema design for the four standardized VV&A documents, showing the use of the common elements and local (to the individual schema files) declaration of information elements particular to each respective VV&A document. In some cases we will find that the concepts presented across two or more VV&A documents are the same, even though they are titled differently in the respective documents. Structures that are defined in the Base Types XML schema will be identified as such when they are used in a particular document. These will be presented once, on first use, and then referenced thereafter. The discussion

follows the organization of the documents defined in MIL-STD-3022. That information is supplemented with design decisions made in specifying graphical user interface mock-ups for DVDT development. Common data content that can be used across documents will also be identified as applicable. Complete documentation of the VV&A documentation schemas is provided in the appendixes to this report.

D. ACCREDITATION PLAN SCHEMA

The Accreditation Plan focuses on: (1) defining the criteria to be used during the accreditation assessment; (2) defining the methodology to conduct the accreditation assessment; (3) defining the resources needed to perform the accreditation assessment; and (4) identifying issues associated with performing the accreditation assessment.

The root element of the Accreditation Plan XML document is AccreditationPlan. It has the following child elements:

- ProjectReferenceID – This element holds a reference to the project identifier automatically entered in the document file by the DVDT software. This reference does not appear in the content of the Accreditation Plan document. The element type is declared to be ProjectReferenceIDType, a simple type defined as type xs:string (string data type defined in the W3C XML Schema language, designated with namespace prefix “xs:”) in the VV&A Documentation Base Types schema.
- DocumentReferenceID – This element holds a document identifier automatically assigned to this document by the DVDT software. This identifier does not appear in the content of the Accreditation Plan document. The element type is declared to be DocumentReferenceIDType, a simple type defined as type xs:string in the VV&A Documentation Base Types schema.
- AccreditationPlanTitlePage – This element contains title page information for the document. The element type is declared to be DocumentTitlePageType, a complex type defined in the VV&A

Documentation Base Types schema and described in detail later in this section. The structure of the AccreditationPlanTitlePage element corresponds to the description of title page content provided in paragraph A.2 of MIL-STD-3022.

- RecordOfChanges – A record of changes made to evolving versions of the document. The element type is declared to be RecordOfChangesType, a complex type defined in the VV&A Documentation Base Types schema and described in detail later in this section. The structure of the RecordOfChanges element corresponds to the description of record of changes content provided in paragraph A.3 of MIL-STD-3022.
- ExecutiveSummary – This element provides an overview of the Accreditation Plan. The element type is declared to be xs:string base type, with an optional attribute named “heading” to hold the title of the section (with default value set to “ACCREDITATION PLAN EXECUTIVE SUMMARY”). The structure of the ExecutiveSummary element corresponds to the description provided in paragraph A.5 of MIL-STD-3022.
- ProblemStatement – This element describes the problem the M&S is expected to address. The problem statement serves as the foundation for the definition of requirements, acceptability criteria, and ultimately the accreditation assessment by documenting (1) the question(s) to be answered and/or th particular aspects of the problem that the M&S will be used to help address; (2) the decisions that will be made based on the M&S results; and (3) the consequences resulting from erroneous M&S outputs. The element type is declared to be ProblemStatementType, a complex type defined in the VV&A Documentation Base Types schema and described in detail later in this section. The structure of the ProblemStatement element corresponds to the description of content provided in paragraph A.6 of MIL-STD-3022.

- **MSRequirementsAcceptability** – This element describes the M&S requirements defined for the intended use, the derived acceptability criteria that should be met to satisfy the requirements, the quantitative and qualitative metrics used to measure their success, and the order of their priority. The element type is declared to be **MSRequirementsAcceptabilityType**, a complex type defined in the VV&A Documentation Base Types schema and described in detail later in this section. The structure of the **MSRequirementsAcceptability** element corresponds to the description of content provided in paragraph A.7 of MIL-STD-3022.
- **MSAssumptionsCapabilitiesLimitationsRisksImpacts** – This element contains a description of known factors that constrain the development and/or use of the M&S or that impede the VV&A effort, including the assumptions, capabilities, limitations, and risk factors affecting M&S development and risks associated with using the M&S for the intended use. The element type is declared to be **MSCharacterizationType**, a complex type defined in the VV&A Documentation Base Types schema and described in detail later in this section. The structure of the **MSAssumptionsCapabilitiesLimitationsRisksImpacts** element corresponds to the description of content provided in paragraph A.8 of MIL-STD-3022.
- **AccreditationMethodology** – This element describes the methods to be used in the accreditation assessment. The element structure is declared to be a complex type with child elements for text entry, description of information needed to conduct the accreditation assessment, description of how, when, and from whom the information is to be provided, and an assessment plan. This structure is described in more detail later in this section. The structure of the **AccreditationMethodology** element corresponds to the description of content provided in paragraph A.9 of MIL-STD-3022.

- AccreditationIssues – This element contains a description of issues associated with the accreditation effort that may arise due to resourcing, scheduling, development, or data problems. The element type is declared to be xs:string base type, with an optional attribute named “heading” to hold the title of the section (with default value set to “ACCREDITATION ISSUES”). The structure of the AccreditationIssues element corresponds to the description of record of changes content provided in paragraph A.10 of MIL-STD-3022.
- KeyParticipants – This element identifies the participants involved in the VV&A effort as well as the roles that they are assigned and their key responsibilities within that role. The element structure is declared to be a complex type with child elements for text entry, accreditation participants, V&V participants, and other participants. This structure is described in more detail later in this section. The structure of the KeyParticipants element corresponds to the description of content provided in paragraph A.11 of MIL-STD-3022.
- PlannedAccreditationResources – This element describes the resources required to implement the Accreditation Plan, such as performers, man-hours, materials, and funding. The element structure is declared to be a complex type with child elements for text entry, accreditation resource requirements, and accreditation milestones and timeline. This structure is described in more detail later in this section. The structure of the PlannedAccreditationResources element corresponds to the description of content provided in paragraph A.12 of MIL-STD-3022.
- MSDescription – This element contains pertinent detailed information about the M&S being assessed. The element type is declared to be MSDescriptionType, a complex type defined in the VV&A Documentation Base Types schema and described in detail later in this section. The structure of the MSDescription element corresponds to the description of content provided in paragraph A.13 of MIL-STD-3022.

- MSRequirementsTraceability – This element establishes links between the various M&S requirements, the acceptability criteria, and the evidence collected during the V&V processes. The element type is declared to be MSRequirementsTraceabilityType, a complex type defined in the VV&A Documentation Base Types schema and described in detail later in this section. The structure of the MSRequirementsTraceability element corresponds to the description of content provided in paragraph A.14 of MIL-STD-3022.
- BasisOfComparison – This element describes the basis of comparison used for validation. The basis of comparison serves as the reference against which the accuracy of the M&S representations is measured. The element type is declared to be BasisOfComparisonType, a complex type defined in the VV&A Documentation Base Types schema and described in detail later in this section. The structure of the BasisOfComparison element corresponds to the description of content provided in paragraph A.15 of MIL-STD-3022.
- References – This element identifies all of the references used in the development of this document. The element type is declared to be ReferencesType, a complex type defined in the VV&A Documentation Base Types schema and described in detail later in this section. The structure of the References element corresponds to the description of content provided in paragraph A.16 of MIL-STD-3022.
- Acronyms – This element identifies all acronyms used in this document. The element type is declared to be AcronymsType, a complex type defined in the VV&A Documentation Base Types schema and described in detail later in this section. The structure of the Acronyms element corresponds to the description of content provided in paragraph A.17 of MIL-STD-3022.

- Glossary – This element contains definitions that aid in understanding the document. The element type is declared to be GlossaryType, a complex type defined in the VV&A Documentation Base Types schema and described in detail later in this section. The structure of the Glossary element corresponds to the description provided in paragraph A.18 of MIL-STD-3022.
- AccreditationProgrammatics – This element contains detailed information regarding resource allocation and funding that can be used to track VV&A expenditures. The element type is declared to be ProgrammaticsType, a complex type defined in the VV&A Documentation Base Types schema and described in detail later in this section, with an extension to add “heading” attribute to hold the title of the section (with default value set to “ACCREDITATION PROGRAMMATICS”). The structure of the AccreditationProgrammatics element corresponds to the description of content provided in paragraph A.19 of MIL-STD-3022.
- DistributionList – This element provides the distribution list for hardcopies or digital copies of the approved document. The element type is declared to be DistributionListType, a complex type defined in the VV&A Documentation Base Types schema and described in detail later in this section. The structure of the DistributionList element corresponds to the description of content provided in paragraph A.20 of MIL-STD-3022.

In the following subsections, each of these major elements of the Accreditation Plan XML structure is described in further detail.

1. Document Title Page

The structure of the title page for the Accreditation Plan is provided by the DocumentTitlePageType complex type defined in the VVADocumentationBaseTypes schema. The structure contains the following child elements:

- ProgramIdentification – This element identifies the program, project, exercise, or study indicating the context for the document. The element holds simple text content.
- SponsoringOrganizationOrPM – This element identifies the sponsoring organization or program manager for the document. The element type is declared to be xs:string.
- MSName – This element identifies the model or simulation serving as the context for this document. The element type is declared to be xs:string.
- MSVersion – This element identifies the version of the model or simulation addressed by the document. The element type is declared to be xs:string.
- DocumentType – This element identifies the type of document. In this case, the element would generally be set to “Accreditation Plan” but the structure allows for entry of a user-specified document type. The element type is declared to be xs:string.
- DocumentTitle – This element contains the title of the document. The element type is declared to be xs:string.
- DocumentVersion – This element identifies the version of the document. The element type is declared to be xs:string.
- DocumentDate – This element provides the date of the document. The element type is declared to be xs:string.
- DocumentPreparer – This element identifies the preparer of the document. The element type is declared to be xs:string.
- DistributionStatement – This element identifies the distribution directive for the document. The element type is declared to be xs:string.
- Security – This element identifies the classification of the document. The element type is declared to be xs:string.

2. Record of Changes

The structure of the Record of Changes for the Accreditation Plan is provided by the RecordOfChangesType complex type defined in the VVADocumentationBaseTypes schema. The structure contains a sequence of zero or more RecordOfChange elements and an optional “heading” attribute to hold the title of the section (with default value set to “RECORD OF CHANGES”). The RecordOfChange element is defined by the RecordOfChangeType complex type containing the following child elements:

- Version – This element identifies the version of the document to which the change applies. The element holds simple text content.
- Date – This element identifies the date of the change to the document. The element holds simple text content.
- Changes – This element describes the change(s) made to the identified version of the document. The element holds simple text content.

3. Accreditation Plan Executive Summary

The ExecutiveSummary element was fully described above.

4. Problem Statement

The structure of the ProblemStatement element for the Accreditation Plan is provided by the ProblemStatementType complex type defined in the VVADocumentationBaseTypes schema. The structure contains a sequence of elements defined as a group named GeneralProblemStatementElements and includes an optional “heading” attribute to hold the title of the section (with default value set to “PROBLEM STATEMENT”). An element group such as GeneralProblemStatementElements is used when certain collections of elements appear in more than one complex type structure, and can therefore be referenced in multiple structures (we will see how this group is used elsewhere when discussing the structure of the V&V Plan). The GeneralProblemStatementElements group contains the following elements:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is

defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).

- **IntendedUse** – This element describes the problem to be addressed by the M&S, including the system or process being represented and the role it plays in the overall program. The content structure is defined in the VVADocumentationBaseTypes schema as IntendedUseType, a complex type allowing entry of text (xs:string) with an optional “heading” attribute to hold the title of the section (with default value set to “Intended Use”).
- **MSOverview** – This element provides an overview of the M&S for which the document is written and discusses the level of configuration control that currently exists for the M&S. The content structure is defined as a complex type allowing entry of text (xs:string) with an optional “heading” attribute to hold the title of the section (with default value set to “M&S Overview”).
- **MSApplication** – This element describes how the M&S will be used in the overall program and lists the program objectives the M&S must meet in order to fulfill the intended use. The content structure is defined as a complex type allowing entry of text (xs:string) with an optional “heading” attribute to hold the title of the section (with default value set to “M&S Application”).
- **AccreditationScope** – This element describes the scope of the accreditation effort based on the assessment of the risk of using the M&S and the availability of resources. The content structure is defined as a complex type allowing entry of text (xs:string) with an optional “heading” attribute to hold the title of the section (with default value set to “Accreditation Scope”).

5. M&S Requirements and Acceptability Criteria

The structure of the MSRequirementsAcceptability element for the Accreditation Plan is provided by the MSRequirementsAcceptabilityType complex type defined in the

VVADocumentationBaseTypes schema. The structure contains a sequence of elements and includes an optional “heading” attribute to hold the title of the section (with default value set to “M&S REQUIREMENTS AND ACCEPTABILITY CRITERIA”). The child elements include:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- MSRequirements – This is an optional element listing the requirements and acceptability criteria for the accreditation effort being planned. The content structure is defined in the VVADocumentationBaseTypes schema as MSRequirementsType, a complex type consisting of a sequence of one or more MSRequirement elements. Each MSRequirement element is defined in the VVADocumentationBaseTypes schema as MSRequirementType, a complex type consisting of a sequence of the following child elements:
 - Priority – This element identifies the priority assigned to a particular requirement. It is defined in the VVADocumentationBaseTypes schema by RequirementPriorityType, a simple type defined as xs:string with a minimum length of 1 character.
 - Requirement Number – This element identifies a number or other label for a particular requirement. It allows text entry (xs:string).
 - Requirement – This is an optional element providing a statement of the requirement. It allows text entry (xs:string).
 - MSAcceptabilityCriteria – This is a list of acceptability criteria applicable to the requirement. It is defined in the VVADocumentationBaseTypes schema as

MSAcceptabilityCriteriaType, a complex type consisting of a sequence of one or more AcceptabilityCriterion elements. Each AcceptabilityCriterion element is defined in the

VVADocumentationBaseTypes schema by

AcceptabilityCriterionType, a complex type consisting of a sequence of the following child elements:

- CriterionNumber – This is a number or label for the acceptability criterion being defined. It allows text entry (xs:string).
- Criterion – An optional element providing a statement of the criterion. It allows text entry (xs:string).
- MetricsOrMeasures – A list of the metrics or measures associated with an acceptability criterion. Its structure is defined in the VVADocumentationBaseTypes schema by MetricsOrMeasuresType, a complex type consisting of a sequence of one or more MetricOrMeasure elements. The MetricOrMeasure elements are defined in the base types schema as MetricOrMeasureType, a complex type consisting of a sequence of the following child elements:
 - MetricOrMeasureNumber – This is a number or label for the metric or measure being defined. It allows text entry (xs:string).
 - MetricOrMeasureDescription – An optional element providing a description of the metric or measure (xs:string).
- VVTasksActivities – This is an optional element identifying tasks and activities associated with V&V of a requirement. It is not used in entry of information for the

Accreditation Plan, so it will be described more fully later in this chapter.

This structure supports preparation of the document through entry of data into the table shown in Table 2.

Table 2. M&S Requirements & Acceptability Criteria (example)

Priority	REQ#	M&S Requirement	AC#	Acceptability Criterion	M/M#	Metric/Measure
1	1	[enter text]	1.1	[enter text]	1.1.1	[enter text]
					1.1.2	[enter text]
					1.1.3	[enter text]
			1.2	[enter text]	1.2.1	[enter text]
					1.2.2	[enter text]
			1.n	[enter text]	1.n.n	[enter text]
2	2	[enter text]	2.1	[enter text]	2.1.1	[enter text]
3	3	[enter text]	n.n	[enter text]	n.n.n	[enter text]

6. M&S Assumptions, Capabilities, Limitations, & Risks/Impacts

The structure of the MSAssumptionsCapabilitiesLimitationsRisksImpacts element for the Accreditation Plan is provided by the MSCharacterizationType complex type defined in the VVADocumentationBaseTypes schema. The structure contains a sequence of elements and includes an optional “heading” attribute to hold the title of the section (with default value set to “M&S ASSUMPTIONS, CAPABILITIES, LIMITATIONS, & RISKS/IMPACTS”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- MSAssumptions – This element describes the known assumptions about the M&S and the data used in support of the M&S in the context of the problem. The content structure is defined as a complex type allowing entry of text (xs:string) with an optional “heading” attribute to hold the title of the section (with default value set to “M&S Assumptions”).

- **MSCapabilities** – This element describes the known capabilities of the M&S. The content structure is defined as a complex type allowing entry of text (xs:string) with an optional “heading” attribute to hold the title of the section (with default value set to “M&S Capabilities”).
- **MSLimitations** – This element describes the known constraints and limitations under which the M&S will be developed, tested, and used, including constraints on M&S development that result in limitations in M&S capabilities, as well as constraints on M&S testing and evaluation that result in inadequate information regarding M&S capability. The content structure is defined as a complex type allowing entry of text (xs:string) with an optional “heading” attribute to hold the title of the section (with default value set to “M&S Limitations”).
- **MSRisksImpacts** – This element describes the risks associated with developing and/or using the M&S for the intended use including the risks resulting from identified constraints and limitations and the risks associated with doing and/or not doing various VV&A tasks as well as the impacts associated with those tasks. The content structure is defined as a complex type allowing entry of text (xs:string) with an optional “heading” attribute to hold the title of the section (with default value set to “M&S Risks/Impacts”).

7. Accreditation Methodology

The structure of the AccreditationMethodology element for the Accreditation Plan is defined in the AccreditationPlan schema as a sequence of elements and includes an optional “heading” attribute to hold the title of the section (with default value set to “ACCREDITATION METHODOLOGY”). The child elements include the following:

- **TextEntry** – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).

- InformationNeeds – This element describes the information needed to conduct the accreditation assessment. The structure is defined in the VVADocumentationBaseTypes schema by InformationNeedsType, a complex type consisting of a sequence of elements and an optional “heading” attribute to hold the title of the section (with default value set to “Accreditation Information Needs”). The child elements include the following:
 - TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
 - InformationNeed – This optional element describes an item of information needed to perform the plan. The InformationNeedsType permits zero or more InformationNeed elements to be entered. Each InformationNeed element is defined in the base types schema by InformationNeedType, a complex type consisting of the following child elements:
 - Number – This element is a number or label for a particular information need. It allows text entry.
 - InformationNeeded – This element provides a description of a particular information need. It allows text entry.

This structure supports preparation of the document through entry of data into the table shown in Table 3.

Table 3. Accreditation Information Needs

#	Information Needed
[enter text]	[enter text]

- InformationCollectionPlan – This element describes how, when, and from whom the information is to be obtained, the form in which the information is to be provided, and the priority of each item. The structure is defined in the VVADocumentationBaseTypes schema by InformationCollectionPlanType, a complex type consisting of a sequence of elements and an optional “heading” attribute to hold the title of the section (with default value set to “Information Collection Plan”). The child elements include the following:
 - TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
 - InformationToCollect – This optional element describes an item of information to be collected to perform the plan. The InformationCollectionPlanType permits zero or more InformationToCollect elements to be entered. Each InformationToCollect element is defined in the base types schema by InformationToCollectType, a complex type consisting of the following child elements:
 - Number – This element is a number or identifier assigned to a collection plan activity for a specific information need. It allows text entry.
 - Information – This optional element describes the information associated with a collection plan activity. It allows text entry.
 - How – This element describes how the identified information is to be collected. It allows text entry.

- When – This element identifies when the identified information is to be collected. It allows text entry.
- FromWhom – This element identifies from whom the identified information is to be collected. It allows text entry.
- Form – This element identifies the form the information will be obtained for a particular collection plan activity. It allows text entry.
- Priority – This element identifies the priority assigned to the collection plan activity for a specific information need. It allows text entry.

This structure supports preparation of the document through entry of data into the table shown in Table 4.

Table 4. Information Collection Plan

#	Information	How	When	From Whom	Form	Priority
[enter text]						

- AssessmentPlan – This element describes the assessment events, including the assessment techniques to be used and the specific roles and responsibilities of the participants, the milestones to be achieved, and the products to be produced. The structure is defined in the VVADocumentationBaseTypes schema by AssessmentPlanType, a complex type allowing entry of text (xs:string) with an optional “heading” attribute to hold the title of the section (with default value set to “Assessment Plan”).

8. Accreditation Issues

The structure of the AccreditationIssues element for the Accreditation Plan is defined in the AccreditationPlan schema as a complex type extending xs:string (string

content) with an optional “heading” attribute to hold the title of the section (with default value set to “ACCREDITATION ISSUES”).

9. Key Participants

The structure of the KeyParticipants element for the Accreditation Plan is defined in the AccreditationPlan schema as a sequence of elements and includes an optional “heading” attribute to hold the title of the section (with default value set to “KEY PARTICIPANTS”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- AccreditationParticipants – This element identifies the participants involved in the accreditation effort, including their contact information, assigned role, and the key responsibilities associated with that role. The structure is defined in the AccreditationPlan schema by extending the ParticipantsType data construct to add an optional “heading” attribute to hold the title of the section (with default value set to “Accreditation Participants”). ParticipantsType is defined in the VVADocumentationBaseTypes schema as a complex type consisting of a sequence of the following child elements:
 - TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
 - Participants – This optional element (defined in the base types schema as ParticipantListType) contains a list of one or more Participant elements. Each Participant element is defined in the

base types schema by ParticipantType, a complex type consisting of a sequence of the following child elements:

- ParticipantName – Name of the participant (xs:string).
- ContactInformation – This element provides contact information on the identified participant. The content structure is defined in the base types schema by ContactInformationType, a complex type consisting of a sequence of the following elements: Organization (text); Email (text); and Phone (text).
- RolePosition – This element identifies the role or position assigned to the participant. It allows text entry (xs:string).
- KeyResponsibilities – This element identifies the responsibilities assigned to the participant. It allows text entry (xs:string).
- SMEQualifications – This element describes subject matter expert qualifications for the participant. It allows text entry (xs:string).

This structure supports preparation of the document through entry of data into the table shown in Table 5.

Table 5. Accreditation Participants

Participant Name	Contact Information	Role/Position	Key Responsibilities	SME Qualifications
[enter text]	Org: Email: Phone:	[enter text]	[enter text]	[enter text]

- VVParticipants – This element identifies the participants involved in the V&V effort, including their contact information, assigned role, and the key responsibilities associated with that role. The structure is defined in the AccreditationPlan schema by extending the ParticipantsType data

construct to add an optional “heading” attribute to hold the title of the section (with default value set to “V&V Participants”). The structure of ParticipantsType was described above.

This structure supports preparation of the document through entry of data into the table shown in Table 6.

Table 6. V&V Participants

Participant Name	Contact Information	Role/Position	Key Responsibilities	SME Qualifications
[enter text]	Org: Email: Phone:	[enter text]	[enter text]	[enter text]

- OtherParticipants – This element identifies the the members of the application program and model development effort with V&V or accreditation responsibilities as well as others who have a role in the VV&A process. The structure is defined in the AccreditationPlan schema by extending the ParticipantsType data construct to add an optional “heading” attribute to hold the title of the section (with default value set to “Other Participants”). The structure of ParticipantsType was described above.

This structure supports preparation of the document through entry of data into the table shown in Table 7.

Table 7. Other Participants

Participant Name	Contact Information	Role/Position	Key Responsibilities	SME Qualifications
[enter text]	Org: Email: Phone:	[enter text]	[enter text]	[enter text]

10. Planned Accreditation Resources

The structure of the PlannedAccreditationResources element for the Accreditation Plan is defined in the AccreditationPlan schema as a sequence of elements and includes an optional “heading” attribute to hold the title of the section (with default value set to

“PLANNED ACCREDITATION RESOURCES”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- AccreditationResourceRequirements – This element identifies the resources needed to accomplish the accreditation. The structure is defined in the AccreditationPlan schema as a complex type extending xs:string (string content) with an optional “heading” attribute to hold the title of the section (with default value set to “Accreditation Resource Requirements”).
- AccreditationMilestonesAndTimeline – This element provides a chart of the overall program timeline with program, development, V&V, and accreditation milestones. The structure is defined in the AccreditationPlan schema as a complex type extending xs:string (string content) with an optional “heading” attribute to hold the title of the section (with default value set to “Accreditation Milestones and Timeline”).

11. M&S Description

The structure of the MSDescription element for the Accreditation Plan is defined in the VVADocumentationBaseTypes schema by MSDescriptionType, a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “M&S DESCRIPTION”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).

- MSOverview – This element provides a description of the M&S including the type of model (e.g., stochastic, deterministic, high resolution, low resolution, human in the loop, hardware in the loop, stand-alone, engineering, aggregated), and what types of problems it is intended to support (e.g., training, force structure analysis, command and control, experimentation, system analysis, analysis of alternatives). The structure is defined in the VVADocumentationBaseTypes schema as a complex type extending xs:string (string content) with an optional “heading” attribute to hold the title of the section (with default value set to “M&S Overview”).
- MSDevelopmentAndStructure – This element provides information about how the M&S was or will be developed, including the M&S development plan identifying the development paradigm (e.g., spiral development, model-test-model), and basic assumptions about its execution. The structure is defined in the VVADocumentationBaseTypes schema as a complex type extending xs:string (string content) with an optional “heading” attribute to hold the title of the section (with default value set to “M&S Development and Structure”).
- MSCapabilitiesAndLimitations – This element summarizes the capabilities and limitations of the M&S. The structure is defined in the VVADocumentationBaseTypes schema as a complex type extending xs:string (string content) with an optional “heading” attribute to hold the title of the section (with default value set to “M&S Capabilities and Limitations”).
- MSUseHistory – This element describes how and when the M&S has been used in the past as well as references relevant historical use documents. The structure is defined in the VVADocumentationBaseTypes schema by MSUseHistoryType, a complex type extending xs:string (string content) with an optional “heading” attribute to hold the title of the section (with default value set to “M&S Use History”).

- MSData – This element describes data used to initialize the M&S and data produced by the M&S. The structure is defined in the VVADocumentationBaseTypes schema MSDataType, a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Data”). The child elements include the following:
 - TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
 - InputData – This element identifies the data required to populate and execute the M&S, including input data sets, hard-wired data (constants), environmental data, and operational data. The structure is defined in the VVADocumentationBaseTypes schema as a complex type extending xs:string (string content) with an optional “heading” attribute to hold the title of the section (with default value set to “Input Data”).
 - OutputData – This element identifies the M&S output data, including a definition, the unit of measure, and the range of values for each data item. The structure is defined in the VVADocumentationBaseTypes schema as a complex type extending xs:string (string content) with an optional “heading” attribute to hold the title of the section (with default value set to “Output Data”).
- ConfigurationManagement – This element provides a description of the M&S including the type of model (e.g., stochastic, deterministic, high resolution, low resolution, human in the loop, hardware in the loop, stand-alone, engineering, aggregated), and what types of problems it is intended

to support (e.g., training, force structure analysis, command and control, experimentation, system analysis, analysis of alternatives). The structure is defined in the VVADocumentationBaseTypes schema as a complex type extending xs:string (string content) with an optional “heading” attribute to hold the title of the section (with default value set to “Configuration Management”).

12. M&S Requirements Traceability Matrix

The structure of the MSRequirementsTraceability element for the Accreditation Plan is defined in the VVADocumentationBaseTypes schema by MSRequirementsTractabilityType, a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “M&S REQUIREMENTS TRACEABILITY MATRIX”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- MSRequirements – This optional element provides a list of requirements. The structure is defined in the VVADocumentationBaseTypes schema by MSRequirementsType. The structure of this complex type was described previously (refer to the M&S Requirements and Acceptability Criteria section above).

This structure supports preparation of the document through entry of data into the table shown in Table 8. Only the first three columns under Accreditation Plan would be filled in during preparation of that document. The other content is entered during preparation of the respective documents (V&V Plan, V&V Report, and Accreditation Report).

Table 8. M&S Requirements Traceability Matrix

Accreditation Plan			V&V Plan	V&V Report	Accreditation Report	
Priority #	M&S Requirement #	Acceptability Criterion #	Planned V&V Task / Activity #	V&V Task Analysis #	Accreditation Assessment #	
1	1	1.1	1.1.1	1.1.1.1	1.1.1.1.1	
				1.1.1.2	1.1.1.2.1	
			1.1.2	1.1.2.1	1.1.2.1.1	
		1.2	1.2.1	1.1.3	1.1.3.1	1.1.3.1.1
				1.2.1	1.2.1.1	1.2.1.1.1
			1.2.2	1.2.2.1	1.2.2.1.1	
			1.2.2	1.2.2.1	1.2.2.1	
1.n	1.n.n	1.n.n.n	1.n.n.n.n			
2	2	2.1	2.1.1	2.1.1.1	2.1.1.1.1	
					2.1.1.1.2	
3	n	n.n	n.n.n	n.n.n.n	n.n.n.n.n	

13. Basis of Comparison

The structure of the BasisOfComparison element for the Accreditation Plan is defined in the VVADocumentationBaseTypes schema by BasisOfComparisonType, a complex type extending xs:string (string content) to add an optional “heading” attribute to hold the title of the section (with default value set to “BASIS OF COMPARISON”).

14. References

The structure of the References element for the Accreditation Plan is defined in the VVADocumentationBaseTypes schema by ReferencesType, a complex type extending xs:string (string content) to add an optional “heading” attribute to hold the title of the section (with default value set to “REFERENCES”).

15. Acronyms

The structure of the Acronyms element for the Accreditation Plan is defined in the VVADocumentationBaseTypes schema by AcronymsType, a complex type extending xs:string (string content) to add an optional “heading” attribute to hold the title of the section (with default value set to “ACRONYMS”).

16. Glossary

The structure of the Glossary element for the Accreditation Plan is defined in the VVADocumentationBaseTypes schema by GlossaryType, a complex type extending

xs:string (string content) to add an optional “heading” attribute to hold the title of the section (with default value set to “GLOSSARY”).

17. Accreditation Programmatic

The structure of the AccreditationProgrammatic element for the Accreditation Plan is defined in the AccreditationPlan schema as a complex type extending the base type ProgrammaticType to add an optional “heading” attribute to hold the title of the section (with default value set to “ACCREDITATION PROGRAMMATIC”). The ProgrammaticType is declared in the VVADocumentationBaseTypes schema as a complex type containing text content to provide detailed information regarding source allocation and funding that can be used to track VV&A expenditures (e.g., Activity, Required Resources, Funding Source, Funds by Fiscal Year and Quarter).

18. Distribution List

The structure of the DistributionList element for the Accreditation Plan is defined in the VVADocumentationBaseTypes schema by DistributionListType, a complex type extending xs:string (string content) to add an optional “heading” attribute to hold the title of the section (with default value set to “DISTRIBUTION LIST”).

E. V&V PLAN SCHEMA

The V&V Plan focuses on: (1) defining the methodology for scoping the V&V effort to the application and the acceptability criteria; (2) defining the V&V tasks that will produce information to support the accreditation assessment; (3) defining the resources needed to perform the V&V; and (4) identifying issues associated with performing the V&V.

The root element of the V&V Plan XML document is VVPlan. It has the following child elements:

- ProjectReferenceID – as described previously.
- DocumentReferenceID – as described previously.
- VVPlanTitlePage – This element contains title page information for the document. The element type is declared to be DocumentTitlePageType, described previously.

- RecordOfChanges – A record of changes made to evolving versions of the document. The element type is declared to be RecordOfChangesType, described previously.
- ExecutiveSummary – This element provides an overview of the V&V Plan. The element type is declared to be xs:string base type, with an optional attribute named “heading” to hold the title of the section (with default value set to “V&V PLAN EXECUTIVE SUMMARY”). The structure of the ExecutiveSummary element corresponds to the description provided in paragraph B.5 of MIL-STD-3022.
- ProblemStatement – This element describes the problem the M&S is expected to address. The element type is declared to be VVProblemStatementType, a complex type defined in the VV&A Documentation Base Types schema and described in detail later in this section. The structure of the ProblemStatement element corresponds to the description of content provided in paragraph B.6 of MIL-STD-3022.
- MSRequirementsAcceptability – This element describes the M&S requirements defined for the intended use, the derived acceptability criteria that should be met to satisfy the requirements, the quantitative and qualitative metrics used to measure their success, and the order of their priority. The element type is declared to be MSRequirementsAcceptabilityType, described previously. The structure of the MSRequirementsAcceptability element corresponds to the description of content provided in paragraph B.7 of MIL-STD-3022.
- MSAssumptionsCapabilitiesLimitationsRisksImpacts – This element contains a description of known factors that constrain the development and/or use of the M&S or that impede the VV&A effort, including the assumptions, capabilities, limitations, and risk factors affecting M&S development and risks associated with using the M&S for the intended use. The element type is declared to be MSCharacterizationType,

described previously. The structure of the MSAssumptionsCapabilitiesLimitationsRisksImpacts element corresponds to the description of content provided in paragraph B.8 of MIL-STD-3022.

- VVMethodology – This element contains a step-by-step road-map of how the V&V tasks should be performed, including each task’s objectives, assumptions, constraints, criteria, methodology, and how they should be measured and evaluated. The element structure is declared to be a complex type with child elements for text entry, planned data V&V tasks/activities, planned conceptual model validation tasks/activities, planned design verification tasks/activities, planned implementation verification tasks/activities, planned results validation tasks/activities, and planned V&V reporting tasks/activities. This structure is described in more detail later in this section. The structure of the VVMethodology element corresponds to the description of content provided in paragraph B.9 of MIL-STD-3022.
- VVIssues – This element discusses the important unresolved issues relevant to this stage of the VV&A effort, including administration, coordination, and execution. The element type is declared to be xs:string base type, with an optional attribute named “heading” to hold the title of the section (with default value set to “V&V ISSUES”). The structure of the VVIssues element corresponds to the description of record of changes content provided in paragraph B.10 of MIL-STD-3022.
- KeyParticipants – This element identifies the participants involved in the VV&A effort as well as the roles that they are assigned and their key responsibilities within that role. The element structure is declared to be a complex type with child elements for text entry, accreditation participants, V&V participants, and other participants. This structure is described in more detail later in this section. The structure of the KeyParticipants element corresponds to the description of content provided in paragraph B.11 of MIL-STD-3022.

- **PlannedVVResources** – This element describes the resources required to implement the V&V Plan, such as performers, man-hours, materials, and funding. The element structure is declared to be a complex type with child elements for text entry, V&V resource requirements, and V&V milestones and timeline. This structure is described in more detail later in this section. The structure of the PlannedVVResources element corresponds to the description of content provided in paragraph B.12 of MIL-STD-3022.
- **MSDescription** – This element contains pertinent detailed information about the M&S being assessed. The element type is declared to be MSDescriptionType, described previously. The structure of the MSDescription element corresponds to the description of content provided in paragraph B.13 of MIL-STD-3022.
- **MSRequirementsTraceability** – This element establishes links between the various M&S requirements, the acceptability criteria, and the evidence collected during the V&V processes. The element type is declared to be MSRequirementsTraceabilityType, described previously and discussed in more detail later in this section. The structure of the MSRequirementsTraceability element corresponds to the description of content provided in paragraph B.14 of MIL-STD-3022.
- **BasisOfComparison** – This element describes the basis of comparison used for validation. The basis of comparison serves as the reference against which the accuracy of the M&S representations is measured. The element type is declared to be BasisOfComparisonType, described previously. The structure of the BasisOfComparison element corresponds to the description of content provided in paragraph B.15 of MIL-STD-3022.
- **References** – This element identifies all of the references used in the development of this document. The element type is declared to be ReferencesType, described previously. The structure of the References

element corresponds to the description of content provided in paragraph B.16 of MIL-STD-3022.

- Acronyms – This element identifies all acronyms used in this document. The element type is declared to be AcronymsType, described previously. The structure of the Acronyms element corresponds to the description of content provided in paragraph B.17 of MIL-STD-3022.
- Glossary – This element contains definitions that aid in understanding the document. The element type is declared to be GlossaryType, described previously. The structure of the Glossary element corresponds to the description provided in paragraph B.18 of MIL-STD-3022.
- VVProgrammatics – This element contains detailed information regarding resource allocation and funding. The element type is declared to be ProgrammaticsType, described previously, with an extension to add an optional “heading” attribute to hold the title of the section (with default value set to “V&V PROGRAMMATICS”). The structure of the VVProgrammatics element corresponds to the description of content provided in paragraph B.19 of MIL-STD-3022.
- DistributionList – This element provides the distribution list for hardcopies or digital copies of the approved document. The element type is declared to be DistributionListType, a complex type defined in the VV&A Documentation Base Types schema and described in detail later in this section. The structure of the DistributionList element corresponds to the description of content provided in paragraph B.20 of MIL-STD-3022.
- AccreditationPlanReference – This element provides a reference to the Accreditation Plan for the simulation for which this V&V Plan has been prepared. The element type is declared to be an extension to the base type PriorDocumentAppendixType (defined in the VV&A Documentation Base Types schema) to add an optional “heading” attribute to hold the title of the section (with default value set to “ACCREDITATION PLAN”).

The PriorDocumentAppendixType is defined as a complex type consisting of a single child element, TextEntry, of type TextEntryType (described previously). The structure of the AccreditationPlanReference element corresponds to the description of content provided in paragraph B.21 of MIL-STD-3022.

In the following subsections, each of these major elements of the V&V Plan XML structure is described in further detail.

1. Document Title Page

The structure of the title page for the V&V Plan is provided by the DocumentTitlePageType complex type described previously. For the V&V Plan, the DocumentType child element will generally be set to “V&V Plan” but the structure allows for entry of a user-specified document type.

2. Record of Changes

The structure of the Record of Changes for the V&V Plan is provided by the RecordOfChangesType complex type described previously.

3. V&V Plan Executive Summary

The ExecutiveSummary element was fully described above.

4. Problem Statement

The structure of the ProblemStatement element for the V&V Plan is provided by the VVProblemStatementType complex type defined in the VVADocumentationBaseTypes schema. The structure contains a sequence of elements consisting of a group named GeneralProblemStatementElements and element VVScope, and includes an optional “heading” attribute to hold the title of the section (with default value set to “PROBLEM STATEMENT”). The GeneralProblemStatementElements group was described previously. The VVScope element is defined in the VVADocumentationBaseTypes schema by VVScopeType, a complex type extending xs:string to provide an optional “heading” attribute to hold the title of the section (with default value set to “V&V Scope”).

5. M&S Requirements and Acceptability Criteria

The structure of the MSRequirementsAcceptability element for the V&V Plan is provided by the MSRequirementsAcceptabilityType complex type described previously.

6. M&S Assumptions, Capabilities, Limitations, & Risks/Impacts

The structure of the MSAssumptionsCapabilitiesLimitationsRisksImpacts element for the V&V Plan is provided by the MSCharacterizationType described previously.

7. V&V Methodology

The structure of the VVMethodology element for the V&V Plan is defined in the VVPlan schema as a sequence of elements and includes an optional “heading” attribute to hold the title of the section (with default value set to “V&V METHODOLOGY”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- PlannedDataVVTasksActivities – This element describes planned data V&V tasks/activities. It is defined in the VVPlan schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Planned Data V&V Tasks/Activities”). The child elements include the following:
 - TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
 - DataVerificationTasksActivities – This element describes the overall approach for verifying the data within the context of how it is used in the M&S. It is defined in the VVPlan schema as a

complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Data Verification Tasks/Activities”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- DataVerificationTasksActivitiesList – This element is an optional list containing one or more DataVerificationTaskActivity elements, each of which is defined in the VVADocumentationBaseTypes schema by DataVerificationTaskActivityType, a complex type consisting of a sequence of the following child elements:
 - RequirementNumber – This element is a reference to an M&S requirement. It allows text entry (xs:string).
 - CriterionNumber – This element is a reference to an M&S acceptability criterion. It allows text entry (xs:string).
 - DataVerificationTaskActivityNumber – This element is a number or identifier for the data verification task/activity. It allows text entry (xs:string).
 - DataVerificationTaskActivityDescription – This element is a description of the data verification task/activity. It allows text entry (xs:string).

This structure supports preparation of the document through entry of data into the table shown in Table 9.

Table 9. Planned Data Verification Tasks/Activities

REQ#	AC#	PDVET#	PDVET Description
[from Sec 2]	[from Sec 2]	[enter text]	[enter text]

- DataValidationTasksActivities – This element describes the overall approach for validating the data within the context of how it is used in the M&S. It is defined in the VVPlan schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Data Validation Tasks/Activities”). The child elements include the following:
 - TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
 - DataValidationTasksActivitiesList – This element is an optional list containing one or more DataValidationTaskActivity elements, each of which is defined in the VVADocumentationBaseTypes schema by DataValidationTaskActivityType, a complex type consisting of a sequence of the following child elements:
 - RequirementNumber – This element is a reference to an M&S requirement. It allows text entry (xs:string).

- CriterionNumber – This element is a reference to an M&S acceptability criterion. It allows text entry (xs:string).
- DataValidationTaskActivityNumber – This element is a number or identifier for the data validation task/activity. It allows text entry (xs:string).
- DataValidationTaskActivityDescription – This element is a description of the data validation task/activity. It allows text entry (xs:string).

This structure supports preparation of the document through entry of data into the table shown in Table 10.

Table 10. Planned Data Validation Tasks/Activities (PDVAT)

REQ#	AC#	PDVAT#	PDVAT Description
[from Sec 2]	[from Sec 2]	[enter text]	[enter text]

- RequiredValidationData – This element describes/identifies the data that are needed to implement the tasks, as well as the coordination mechanism and schedule for obtaining the needed data. It is defined in the VVPlan schema as a complex type extending xs:string (string content) to add an optional “heading” attribute to hold the title of the section (with default value set to “Required Validation Data”).
- PlannedConceptualModelActivities – This element describes the overall approach for validating the conceptual model. It is defined in the VVPlan schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Planned Conceptual Model Validation Tasks/Activities”).
The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- ConceptualModelValidationTasksActivitiesList – This element is an optional list containing one or more ConceptualModelValidationTaskActivity elements, each of which is defined in the VVADocumentationBaseTypes schema by ConceptualModelValidationTaskActivityType, a complex type consisting of a sequence of the following child elements:
 - RequirementNumber – This element is a reference to an M&S requirement. It allows text entry (xs:string).
 - CriterionNumber – This element is a reference to an M&S acceptability criterion. It allows text entry (xs:string).
 - ConceptualModelValidationTaskActivityNumber – This element is a number or identifier for the conceptual model task/activity. It allows text entry (xs:string).
 - ConceptualModelValidationTaskActivityDescription – This element is a description of the conceptual model validation task/activity. It allows text entry (xs:string).
 - AuthoritativeResource – This element provides the name and contact information for an authoritative resource (e.g., Subject Matter Expert). It is defined in the VVADocumentationBaseTypes schema by AuthoritativeResourceType, a complex type consisting of a choice of the following child elements:

- SME – This element identifies a Subject Matter Expert (SME) supporting the conceptual model validation task/activity. It is defined in the VVADocumentationBaseTypes by SMEType, a complex type consisting of a sequence of the following child elements:
 - SMENAME – This element gives the SME name. It allows text entry (xs:string).
 - ContactInfo – This element give contact information for the identified SME. It allows text entry (xs:string).
 - Agency – This element identifies the SME’s agency or organization. It allows text entry (xs:string).
 - RelevantExperience – This element describes the SME’s relevant experience. It allows text entry (xs:string).
 - EducationCredentials – This element gives the SME’s education credentials. It allows text entry (xs:string).
 - RelevantPublications – This element identifies relevant publications by the SME. It allows text entry (xs:string).
- ReferenceDocument – This element identifies a document reference supporting the conceptual model validation task/activity. It allows text entry (xs:string).

- ReferenceData – This element identifies a data reference supporting the conceptual model validation task/activity. It allows text entry (xs:string).

This structure supports preparation of the document through entry of data into the table shown in Table 11.

Table 11. Planned Conceptual Model Validation Tasks/Activities (PCMVT)

REQ#	AC#	PCMVT#	PCMVT Description	Authoritative Resource
[from Sec 2]	[from Sec 2]	[enter text]	[enter text]	SME Name: Contact Info: Agency: Summary of relevant experience: Education credentials: Relevant publications:
[from Sec 2]	[from Sec 2]	[enter text]	[enter text]	Reference Document:
[from Sec 2]	[from Sec 2]	[enter text]	[enter text]	Reference Data:

- PlannedDesignVerificationTasksActivities – This element describes the overall approach for verifying the M&S design. It is defined in the VVPlan schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Planned Design Verification Tasks/Activities”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- DesignVerificationTasksActivitiesList – This element is an optional list containing one or more DesignVerificationTaskActivity elements, each of which is defined in the VVADocumentationBaseTypes schema by

DesignVerificationTaskActivityType, a complex type consisting of a sequence of the following child elements:

- RequirementNumber – This element is a reference to an M&S requirement. It allows text entry (xs:string).
- CriterionNumber – This element is a reference to an M&S acceptability criterion. It allows text entry (xs:string).
- DesignVerificationTaskActivityNumber – This element is a number or identifier for the M&S design verification task/activity. It allows text entry (xs:string).
- ConceptualModelSegment – This element identifies the relevant conceptual model segment for the design verification task/activity. It allows text entry (xs:string).
- DesignSegment – This element identifies the relevant design segment for the design verification task/activity. It allows text entry (xs:string).
- ApplicableReferences – This element identifies applicable standards, codes, or best practices relevant to the M&S design verification task/activity. It allows text entry (xs:string).
- Adherence – This element describes how to evaluate adherence to the applicable reference for the design verification task/activity. It allows text entry (xs:string).

This structure supports preparation of the document through entry of data into the table shown in Table 12.

Table 12. Planned Design Verification Tasks/Activities (PDEVET)

REQ#	AC#	PDEVET#	Conceptual Model Segment	Design Segment	Applicable Standards, Codes, Best Practices	How to Evaluate Adherence
[from Sec 2]	[from Sec 2]	[enter text]	[enter text]	[enter text]	[enter text]	[enter text]

- PlannedImplementationVerificationTasksActivities – This element describes the overall approach for verifying the M&S implementation. It is defined in the VVPlan schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Planned Implementation Verification Tasks/Activities”). The child elements include the following:
 - TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
 - SuiteOfTests – This element provides a discussion of the planned scenarios, test cases, and sample size required, as well as a determination of the completeness of the test suite to support traceability to the M&S requirements. It is defined in the VVPlan schema as a complex type extending xs:string to add an optional “heading” attribute to hold the title of the section (with default value set to “Define Suite of Tests”).
 - ImplementationVerificationTestDescription – This element identifies what organization will run the tests, what organization will analyze the results, the time required to do so, and the schedule for accomplishing the runs. It is defined in the VVAPlan schema as a complex type consisting of a sequence of child

elements and an optional “heading” attribute to hold the title of the section (with default value set to “Implementation Verification Test Description”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- ImplementationVerificationTestList – This element is an optional list containing one or more ImplementationVerificationTest elements, each of which is defined in the VVADocumentationBaseTypes schema by ImplementationVerificationTestType, a complex type consisting of a sequence of two element groups, TestDescription and TestSetup, followed by element VerificationTechnique. The element groups are also defined in VVADocumentationBaseTypes. Group TestDescription consists of a sequence of the following elements:
 - TestID – This element holds the name or identification number of the test. It allows text entry (xs:string).
 - TestName – This element holds provides the name of the test. It allows text entry (xs:string).
 - TestDate – This element holds the planned date of the test. It allows text entry (xs:string).
 - TestTime – This element holds the planned time of the test. It allows text entry (xs:string).

- TesterName – This element identifies the name of the tester responsible for conducting the test. It allows text entry (xs:string).
- TesterOrganization – This element identifies the tester's organization.
- TesterPhone – This element provides the phone number of the identified tester. It allows text entry (xs:string).
- TesterEmail – This element provides the e-mail address of the identified tester. It allows text entry (xs:string).

Group TestSetup consists of a sequence of the following elements:

- TestArchitecture – This element describes the hardware/software architecture for the test. It allows text entry (xs:string).
- TestPurpose – This element states the purpose of the test relative to the acceptability criteria. It allows text entry (xs:string).
- CriterionNumber – This element provides a reference to the acceptability criterion related to this test. It allows text entry (xs:string).
- TestDescription – This element provides a brief description of the test. It allows text entry (xs:string).
- TestConditions – This element identifies any prerequisite conditions that must be established

prior to performing the test case. It allows text entry (xs:string).

- TestInputs – This element describes test inputs necessary for the test case. It allows text entry (xs:string).
- ExpectedResults – This element identifies all expected results for the test case. It allows text entry (xs:string).
- TestProcedure – This element defines the test procedure for the test case. It allows text entry (xs:string).
- TestAssumptions – This element identifies any assumptions made in the description of the test case. It allows text entry (xs:string).
- TestConstraints – This element identifies any constraints imposed in the description of the test case. It allows text entry (xs:string).

Element VerificationTechnique describes the verification technique to be used for the test. It allows text entry (xs:string).

This structure supports preparation of the document through entry of data into the table shown in Table 13.

Table 13. Verification Test #1 Description

Information	Description
Test ID#	[enter text]
Test Name	[enter text]
Test Date	[enter text]
Test Time	[enter text]
Tester Name	[enter text]
Tester Organization	[enter text]
Tester Phone	[enter text]

Information	Description
Tester Email	[enter text]
Test Architecture	[enter text]
Test Purpose	[enter text]
Acceptability Criterion #	[enter text]
Test Description	[enter text]
Test Conditions	[enter text]
Test Inputs	[enter text]
Expected Results	[enter text]
Test Procedure	[enter text]
Test Assumptions	[enter text]
Test Constraints	[enter text]
Verification Technique	[enter text]

- **PlannedResultsValidationTasksActivities** – This element describes the overall approach for validating the M&S results. It is defined in the VVPlan schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Planned Results Validation Tasks/Activities”). The child elements include the following:
 - **TextEntry** – This element contains text information introducing this section of the document. It is defined by simple type **TextEntryType** defined in the VVADocumentationBaseTypes schema. **TextEntryType** is defined as `xs:string`, allowing a minimum length of 0 (i.e., the text entry can be empty).
 - **SuiteOfTests** – This element provides a discussion of the planned scenarios, test cases, and sample size required to assess the M&S results from the perspective of the intended use. It is defined in the VVPlan schema as a complex type extending `xs:string` to add an optional “heading” attribute to hold the title of the section (with default value set to “Define Suite of Tests”).
 - **ResultsValidationTestDescription** – This element describes the planned results validation tests, the organization that will run the tests, the organization that will analyze the results, the time

required to do so, and the schedule for accomplishing the tests. It is defined in the VVPlan schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Results Validation Test Description”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- ResultsValidationTestList – This element is an optional list containing one or more ResultsValidationTest elements, each of which is defined in the VVADocumentationBaseTypes schema by ResultsValidationTestType, a complex type consisting of a sequence of two element groups, TestDescription and TestSetup, followed by element ValidationTechnique. The element groups were described previously. The ValidationTechnique element describes the validation technique to be used for the test. It allows text entry (xs:string).

This structure supports preparation of the document through entry of data into the table shown in Table 14.

Table 14. Validation Test #1 Description

Information	Description
Test ID#	[enter text]
Test Name	[enter text]
Test Date	[enter text]
Test Time	[enter text]
Tester Name	[enter text]

Information	Description
Tester Organization	[enter text]
Tester Phone	[enter text]
Tester Email	[enter text]
Test Architecture	[enter text]
Test Purpose	[enter text]
Acceptability Criterion #	[enter text]
Test Description	[enter text]
Test Conditions	[enter text]
Test Inputs	[enter text]
Expected Results	[enter text]
Test Procedure	[enter text]
Test Assumptions	[enter text]
Test Constraints	[enter text]
Validation Technique	[enter text]

- PlannedVVReportingActivities – This element describes the plans for producing and delivering the V&V Report and Accreditation Package. It is defined in the VVPlan schema as a complex type extending xs:string to add an optional “heading” attribute to hold the title of the section (with default value set to “Planned V&V Reporting Tasks/Activities”).

8. V&V Issues

The structure of the VVIssues element for the V&V Plan is defined in the VVPlan schema as a complex type extending xs:string (string content) to add an optional “heading” attribute to hold the title of the section (with default value set to “V&V ISSUES”).

9. Key Participants

The structure of the KeyParticipants element for the V&V Plan is identical to that described in the Accreditation Plan XML structures in the previous section.

10. Planned V&V Resources

The structure of the PlannedVVResources element for the V&V Plan is defined in the VVPlan schema as a sequence of elements and includes an optional “heading” attribute to hold the title of the section (with default value set to “PLANNED V&V RESOURCES”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType

defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).

- VVResourceRequirements – This element identifies the resources needed to accomplish the V&V as planned. The structure is defined in the VVPlan schema as a complex type extending xs:string (string content) with an optional “heading” attribute to hold the title of the section (with default value set to “V&V Resource Requirements”).
- VVMilestonesAndTimeline – This element provides a chart of the overall program timeline with program, development, V&V and accreditation milestones. The structure is defined in the VVPlan schema as a complex type extending xs:string (string content) with an optional “heading” attribute to hold the title of the section (with default value set to “V&V Milestones and Timeline”).

11. M&S Description

The structure of the MSDescription element for the V&V Plan is identical to that described in the Accreditation Plan XML structures in the previous section.

12. M&S Requirements Traceability Matrix

The structure of the MSRequirementsTraceability element for the V&V Plan is defined in the VVADocumentationBaseTypes schema by MSRequirementsTraceabilityType, described previously. In the V&V Plan, the optional element VVTasksActivities in the AcceptabilityCriterionType structure is populated to associate V&V tasks and activities with each requirement. The VVTasksActivities element is defined in the VVADocumentationBaseTypes schema by VVATasksActivitiesType, a complex type consisting of a sequence of the following child elements:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is

defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).

- VVTaskActivity – This element describes a single V&V task/activity. The VVATasksActivitiesType allows one or more VVTaskActivity elements in the sequence. The VVTaskActivity element is defined in the VVADocumentationBaseTypes schema by VVTaskActivityType, a complex type consisting of a sequence of the following child elements:
 - VVTaskActivityNumber – This element holds a number or label identifying the V&V task/activity. The element allows text entry.
 - VVTaskActivityDescription – This is an optional element describing a V&V task/activity. It allows text entry (xs:string).
 - VVTaskAnalyses – This optional element is not populated in the V&V Plan.

This structure supports preparation of the document through entry of data into the table previously shown in Table 8. Preparation of the V&V Plan provides information on V&V tasks/activities in the fourth column of the M&S Requirements Traceability Matrix. Remaining content will be entered during preparation of the remaining documents (V&V Report and Accreditation Report).

13. Basis of Comparison

The structure of the BasisOfComparison element for the V&V Plan is identical to that described in the Accreditation Plan XML structures in the previous section.

14. References

The structure of the References element for the V&V Plan is identical to that described in the Accreditation Plan XML structures in the previous section.

15. Acronyms

The structure of the Acronyms element for the V&V Plan is identical to that described in the Accreditation Plan XML structures in the previous section.

16. Glossary

The structure of the Glossary element for the V&V Plan is identical to that described in the Accreditation Plan XML structures in the previous section.

17. V&V Programmatic

The structure of the VVProgrammatic element for the V&V Plan is defined in the VVPlan schema as a complex type extending the base type ProgrammaticType to add an optional “heading” attribute to hold the title of the section (with default value set to “V&V PROGRAMMATIC”). The ProgrammaticType is declared in the VVADocumentationBaseTypes schema as a complex type containing text content to provide detailed information regarding source allocation and funding that can be used to track VV&A expenditures (e.g., Activity, Required Resources, Funding Source, Funds by Fiscal Year and Quarter).

18. Distribution List

The structure of the DistributionList element for the V&V Plan is identical to that described in the Accreditation Plan XML structures in the previous section.

19. Accreditation Plan

The structure of the AccreditationPlanReference element for the V&V Plan was fully defined when first introduced in this section.

F. V&V REPORT SCHEMA

The V&V Report focuses on: (1) documenting the results of the V&V tasks; (2) documenting M&S assumptions, capabilities, limitations, risks, and impacts; (3) identifying unresolved issues associated with V&V implementation; and (4) documenting lessons learned during V&V.

The root element of the V&V Report XML document is VVReport. It has the following child elements:

- ProjectReferenceID – as described previously.
- DocumentReferenceID – as described previously.
- VVReportTitlePage – This element contains title page information for the document. The element type is declared to be DocumentTitlePageType, described previously.

- RecordOfChanges – A record of changes made to evolving versions of the document. The element type is declared to be RecordOfChangesType, described previously.
- ExecutiveSummary – This element provides an overview of the V&V Report. The element type is declared to be xs:string base type, with an optional attribute named “heading” to hold the title of the section (with default value set to “V&V REPORT EXECUTIVE SUMMARY”). The structure of the ExecutiveSummary element corresponds to the description provided in paragraph C.5 of MIL-STD-3022.
- ProblemStatement – This element describes the problem the M&S is expected to address. The element type is declared to be VVProblemStatementType, a complex type defined in the VV&A Documentation Base Types schema and described in detail later in the previous section. The structure of the ProblemStatement element corresponds to the description of content provided in paragraph C.6 of MIL-STD-3022.
- MSRequirementsAcceptability – This element describes the M&S requirements defined for the intended use, the derived acceptability criteria that should be met to satisfy the requirements, the quantitative and qualitative metrics used to measure their success, and the order of their priority. The element type is declared to be MSRequirementsAcceptabilityType, described previously. The structure of the MSRequirementsAcceptability element corresponds to the description of content provided in paragraph C.7 of MIL-STD-3022.
- MSAssumptionsCapabilitiesLimitationsRisksImpacts – This element contains a description of known factors that constrain the development and/or use of the M&S or that impede the VV&A effort, including the assumptions, capabilities, limitations, and risk factors affecting M&S development and risks associated with using the M&S for the intended

use. The element type is declared to be MSCharacterizationType, described previously. The structure of the MSAssumptionsCapabilitiesLimitationsRisksImpacts element corresponds to the description of content provided in paragraph C.8 of MIL-STD-3022.

- VVTaskAnalysis – This element provides an overview of the results of the V&V inspection and testing activities. The element structure is declared to be a complex type with child elements for text entry, data V&V task analysis, conceptual model validation task analysis, design verification task analysis, implementation verification task analysis, results validation task analysis, and V&V reporting task analysis. This structure is described in more detail later in this section. The structure of the VVTaskAnalysis element corresponds to the description of content provided in paragraph C.9 of MIL-STD-3022.
- VVRecommendations – This element discusses any unresolved issues relevant to the V&V effort and reports activities undertaken to address these issues and associated recommendations. The structure is defined in the VVReport schema as a complex type extending the xs:string base type to add an optional attribute named “heading” to hold the title of the section (with default value set to “V&V RECOMMENDATIONS”). The structure of the VVRecommendations element corresponds to the description of record of changes content provided in paragraph C.10 of MIL-STD-3022.
- KeyParticipants – This element lists the participants involved in the VV&A effort as well as the roles that they are assigned and their key responsibilities within that role. The element structure is declared to be a complex type with child elements for text entry, accreditation participants, V&V participants, and other participants. This structure was described in detail in previous sections. The structure of the KeyParticipants element corresponds to the description of content provided in paragraph C.11 of MIL-STD-3022.

- **ActualVVResourcesExpended** – This element describes the resources expended during execution of the V&V Plan, such as performers, man-hours, materials, and funding. The element structure is declared to be a complex type with child elements for text entry, V&V resources expended, and actual V&V milestones and timeline. This structure is described in more detail later in this section. The structure of the **ActualVVResourcesExpended** element corresponds to the description of content provided in paragraph C.12 of MIL-STD-3022.
- **VVLessonsLearned** – This element provides a summary of the adjustments and lessons learned during the V&V implementation. The structure is defined in the **VVReport** schema as a complex type extending the **xs:string** base type to add an optional attribute named “heading” to hold the title of the section (with default value set to “V&V LESSONS LEARNED”). The structure of the **VVLessonsLearned** element corresponds to the description of content provided in paragraph C.13 of MIL-STD-3022.
- **MSDescription** – This element contains pertinent detailed information about the M&S being assessed. The element type is declared to be **MSDescriptionType**, described previously. The structure of the **MSDescription** element corresponds to the description of content provided in paragraph C.14 of MIL-STD-3022.
- **MSRequirementsTraceability** – This element establishes links between the various M&S requirements, the acceptability criteria, and the evidence collected during the V&V processes. The element type is declared to be **MSRequirementsTraceabilityType**, described previously and discussed in more detail later in this section. The structure of the **MSRequirementsTraceability** element corresponds to the description of content provided in paragraph C.15 of MIL-STD-3022.

- BasisOfComparison – This element describes the basis of comparison used for validation. The basis of comparison serves as the reference against which the accuracy of the M&S representations is measured. The element type is declared to be BasisOfComparisonType, described previously. The structure of the BasisOfComparison element corresponds to the description of content provided in paragraph C.16 of MIL-STD-3022.
- References – This element identifies all of the references used in the development of this document. The element type is declared to be ReferencesType, described previously. The structure of the References element corresponds to the description of content provided in paragraph C.17 of MIL-STD-3022.
- Acronyms – This element identifies all acronyms used in this document. The element type is declared to be AcronymsType, described previously. The structure of the Acronyms element corresponds to the description of content provided in paragraph C.18 of MIL-STD-3022.
- Glossary – This element contains definitions that aid in understanding the document. The element type is declared to be GlossaryType, described previously. The structure of the Glossary element corresponds to the description provided in paragraph C.19 of MIL-STD-3022.
- VVProgrammatics – This element contains detailed information regarding resource allocation and funding. The element type is declared to be ProgrammaticsType, described previously, with an extension to add an optional “heading” attribute to hold the title of the section (with default value set to “V&V PROGRAMMATICS”). The structure of the VVProgrammatics element corresponds to the description of content provided in paragraph C.20 of MIL-STD-3022.
- DistributionList – This element provides the distribution list for hardcopies or digital copies of the approved document. The element type

is declared to be `DistributionListType`, described previously. The structure of the `DistributionList` element corresponds to the description of content provided in paragraph C.21 of MIL-STD-3022.

- `VVPlanReference` – This element provides a reference to the respective M&S V&V Plan. The element type is declared to be an extension to the base type `PriorDocumentAppendixType` (defined in the VV&A Documentation Base Types schema) to add an optional “heading” attribute to hold the title of the section (with default value set to “V&V PLAN”). The `PriorDocumentAppendixType` was described previously. The structure of the `VVPlanReference` element corresponds to the description of content provided in paragraph C.22 of MIL-STD-3022.
- `TestInformation` – This element contains information on scenarios, data, setup, and other information pertinent to the testing conducted. The structure is defined in the `VVReport` schema as a complex type extending the `xs:string` base type to add an optional attribute named “heading” to hold the title of the section (with default value set to “TEST INFORMATION”). The structure of the `TestInformation` element corresponds to the description of content provided in paragraph C.22 of MIL-STD-3022.

In the following subsections, each of these major elements of the V&V Report XML structure is described in further detail.

1. Document Title Page

The structure of the title page for the V&V Report is provided by the `DocumentTitlePageType` complex type described previously. For the V&V Report, the `DocumentType` child element will generally be set to “V&V Report” but the structure allows for entry of a user-specified document type.

2. Record of Changes

The structure of the Record of Changes for the V&V Report is provided by the `RecordOfChangesType` complex type described previously.

3. V&V Report Executive Summary

The ExecutiveSummary element was fully described above.

4. Problem Statement

The structure of the ProblemStatement element for the V&V Report is provided by the VVProblemStatementType complex type described previously.

5. M&S Requirements and Acceptability Criteria

The structure of the MSRequirementsAcceptability element for the V&V Report is provided by the MSRequirementsAcceptabilityType complex type described previously.

6. M&S Assumptions, Capabilities, Limitations, & Risks/Impacts

The structure of the MSAssumptionsCapabilitiesLimitationsRisksImpacts element for the V&V Report is provided by the MSCharacterizationType described previously.

7. V&V Task Analysis

The structure of the VVTaskAnalysis element for the V&V Report is defined in the VVReport schema as a sequence of elements and includes an optional “heading” attribute to hold the title of the section (with default value set to “V&V TASK ANALYSIS”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- DataVVTaskAnalysis – This element describes analysis of the results of data V&V tasks/activities. It is defined in the VVReport schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Data V&V Task Analysis”). The child elements include the following:
 - TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes

schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).

- DataVerificationTaskAnalysis – This element describes analysis of the results of each data verification task. It is defined in the VVReport schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Data Verification Task Analysis”). The child elements include the following:
 - TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
 - DataVerificationTaskAnalysisList – This element is an optional list containing one or more DataVerificationTaskAnalysisItem elements, each of which is defined in the VVADocumentationBaseTypes schema by DataVerificationTaskAnalysisItemType, a complex type consisting of a sequence of the following child elements:
 - RequirementNumber – This element is a reference to an M&S requirement. It allows text entry (xs:string).
 - CriterionNumber – This element is a reference to an M&S acceptability criterion. It allows text entry (xs:string).
 - DataVerificationTaskActivityNumber – This element is a number or identifier for the data

verification task/activity. It allows text entry (xs:string).

- DataVerificationTaskAnalysisNumber – This element is a number or identifier for the data verification task analysis. It allows text entry (xs:string).
- DataVerificationTaskAnalysisDescription – This element is a description of the data verification task analysis. It allows text entry (xs:string).

This structure supports preparation of the document through entry of data into the table shown in Table 15.

Table 15. Data Verification Task Analysis (DVETA)

REQ#	AC#	PDVET#	DVETA#	DVETA Description
[from Sec 2]	[from Sec 2]	[from V&V Plan]	[enter text]	[enter text]

- DataValidationTasksActivities – This element describes the analysis of the results of each data validation task. It is defined in the VVReport schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Data Validation Task Analysis”). The child elements include the following:
 - TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
 - DataValidationTaskAnalysisList – This element is an optional list containing one or more

DataValidationTaskAnalysisItem elements, each of which is defined in the VVADocumentationBaseTypes schema by DataValidationTaskAnalysisItemType, a complex type consisting of a sequence of the following child elements:

- RequirementNumber – This element is a reference to an M&S requirement. It allows text entry (xs:string).
- CriterionNumber – This element is a reference to an M&S acceptability criterion. It allows text entry (xs:string).
- DataValidationTaskActivityNumber – This element is a number or identifier for the data validation task/activity. It allows text entry (xs:string).
- DataValidationTaskAnalysisNumber – This element is a number or identifier for the data validation task analysis. It allows text entry (xs:string).
- DataValidationTaskAnalysisDescription – This element is a description of the data validation task/activity. It allows text entry (xs:string).

This structure supports preparation of the document through entry of data into the table shown in Table 16.

Table 16. Data Validation Task Analysis (DVATA)

REQ#	AC#	PDVAT#	DVATA#	DVATA Description
[from Sec 2]	[from Sec 2]	[from V&V Plan]	[enter text]	[enter text]

- ConceptualModelTaskAnalysis – This element describes the analysis of the results of each conceptual model validation task. It is defined in the VVReport schema as a complex type consisting of a sequence of child

elements and an optional “heading” attribute to hold the title of the section (with default value set to “Conceptual Model Validation Task Analysis”).

The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- ConceptualModelValidationTaskAnalysisList – This element is an optional list containing one or more ConceptualModelValidationTaskAnalysisItem elements, each of which is defined in the VVADocumentationBaseTypes schema by ConceptualModelValidationTaskAnalysisItemType, a complex type consisting of a sequence of the following child elements:
 - RequirementNumber – This element is a reference to an M&S requirement. It allows text entry (xs:string).
 - CriterionNumber – This element is a reference to an M&S acceptability criterion. It allows text entry (xs:string).
 - ConceptualModelValidationTaskActivityNumber – This element is a number or identifier for the conceptual model task/activity. It allows text entry (xs:string).
 - ConceptualModelValidationTaskAnalysisNumber – This element is a number or identifier for the conceptual model task analysis. It allows text entry (xs:string).
 - ConceptualModelValidationTaskAnalysisDescription – This element is a description of the conceptual model validation task analysis. It allows text entry (xs:string).

This structure supports preparation of the document through entry of data into the table shown in Table 17.

Table 17. Conceptual Model Validation Task Analysis (CMVTA)

REQ#	AC#	PCMVT#	CMVTA#	CVMTA Description
[from Sec 2]	[from Sec 2]	[from V&V Plan]	[enter text]	[enter text]

- DesignVerificationTaskAnalysis – This element describes the analysis of the results of each design verification task. It is defined in the VVReport schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Design Verification Task Analysis”). The child elements include the following:
 - TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
 - DesignVerificationTaskAnalysisList – This element is an optional list containing one or more DesignVerificationTaskAnalysisItem elements, each of which is defined in the VVADocumentationBaseTypes schema by DesignVerificationTaskAnalysisItemType, a complex type consisting of a sequence of the following child elements:
 - RequirementNumber – This element is a reference to an M&S requirement. It allows text entry (xs:string).
 - CriterionNumber – This element is a reference to an M&S acceptability criterion. It allows text entry (xs:string).

- DesignVerificationTaskActivityNumber – This element is a number or identifier for the M&S design verification task/activity. It allows text entry (xs:string).
- DesignVerificationTaskAnalysisNumber – This element is a number or identifier for the M&S design verification task analysis. It allows text entry (xs:string).
- DesignVerificationTaskAnalysisDescription – This element is a description of the design verification task analysis. It allows text entry (xs:string).

This structure supports preparation of the document through entry of data into the table shown in Table 18.

Table 18. Design Verification Task Analysis (DVETA)

REQ#	AC#	PDEVET#	DVETA#	DVETA Analysis
[from Sec 2]	[from Sec 2]	[enter text]	[enter text]	[enter text]

- ImplementationVerificationTaskAnalysis – This element describes the analysis of the implementation verification test results. It is defined in the VVReport schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Implementation Verification Task Analysis”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- ImplementationVerificationTestList – This element is an optional list containing one or more ImplementationVerificationTestAnalysisItem elements, each of

which is defined in the VVADocumentationBaseTypes schema by ImplementationVerificationTestAnalysisItemType, a complex type consisting of a sequence of the following child elements:

- TestDescription – This is a group of elements, described previously, consisting of TestID, TestName, TestDate, TestTime, TesterName, TesterOrganization, TesterPhone, and TesterEmail.
- TestOutcomes – This is defined in VVADocumentationBaseTypes as a group consisting of the following elements:
 - TestResults – This element records results for each step of the test procedure executed. It allows text entry (xs:string).
 - TestAnomalies – This element describes any unresolved anomalies encountered during execution of the test. It allows text entry (xs:string).
 - TestDiscrepancies – This element describes any unresolved discrepancies encountered during execution of the test. It allows text entry (xs:string).
- VerificationTechnique, described previously.
- TestAssessment – This is defined in VVADocumentationBaseTypes as a group consisting of the following elements:
 - CorrelateExpectedResults – This element describes correlations of actual outcomes to expected results of the test. It allows text entry (xs:string).
 - AmplifyingInformation – This element includes or references amplifying information that may help to

isolate and correct the cause of any discrepancy. It allows text entry (xs:string).

- TesterAssessment – This element provides the tester’s assessment as to the cause of each discrepancy and a means of correcting it. It allows text entry (xs:string).
- ComparisonToAcceptabilityCriteria – This element provides an assessment and description of how the results compare to the related acceptability criteria. It allows text entry (xs:string).

This structure supports preparation of the document through entry of data into the table shown in Table 19.

Table 19. Verification Test #1 Analysis

Information	Description
Test ID#	[enter text]
Test Name	[enter text]
Test Date	[enter text]
Test Time	[enter text]
Tester Name	[enter text]
Tester Organization	[enter text]
Tester Phone	[enter text]
Tester Email	[enter text]
Test Results	[enter text]
Test Anomalies	[enter text]
Test Discrepancies	[enter text]
Verification Technique	[enter text]
Correlate Expected Results	[enter text]
Amplifying Information	[enter text]
Tester Assessment	[enter text]
Comparison to Acceptability Criteria	[enter text]

- ResultsValidationTaskAnalysis – This element describes the analysis of the validation test results. It is defined in the VVReport schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to

“Results Validation Task Analysis”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- ResultsValidationTestList – This element is an optional list containing one or more ResultsValidationTestAnalysisItem elements, each of which is defined in the VVADocumentationBaseTypes schema by ResultsValidationTestAnalysisItemType, a complex type consisting of a sequence of the following child elements:
 - TestDescription – This is a group of elements, described previously, consisting of TestID, TestName, TestDate, TestTime, TesterName, TesterOrganization, TesterPhone, and TesterEmail.
 - TestOutcomes – This is a group of elements, described previously, consisting of TestResults, TestAnomalies, and TestDiscrepancies.
 - ValidationTechnique, described previously.
 - TestAssessment – This is a group of elements, described previously, consisting of CorrelateExpectedResults, AmplifyingInformation, TesterAssessment, and ComparisonToAcceptabilityCriteria.

This structure supports preparation of the document through entry of data into the table shown in

Table 20.

Table 20. Validation Test #1 Analysis

Information	Description
Test ID#	[enter text]
Test Name	[enter text]
Test Date	[enter text]
Test Time	[enter text]
Tester Name	[enter text]
Tester Organization	[enter text]
Tester Phone	[enter text]
Tester Email	[enter text]
Test Results	[enter text]
Test Anomalies	[enter text]
Test Discrepancies	[enter text]
Validation Technique	[enter text]
Correlate Expected Results	[enter text]
Amplifying Information	[enter text]
Tester Assessment	[enter text]
Comparison to Acceptability Criteria	[enter text]

- ReportingTaskAnalysis – This element describes how the V&V activities were documented and what documentation was delivered. It is defined in the VVReport schema as a complex type extending xs:string to add an optional “heading” attribute to hold the title of the section (with default value set to “V&V Reporting Task Analysis”).

8. V&V Recommendations

The structure of the VVRecommendations element for the V&V Report is defined in the VVReport schema as a complex type extending xs:string (string content) to add an optional “heading” attribute to hold the title of the section (with default value set to “V&V RECOMMENDATIONS”).

9. Key Participants

The structure of the KeyParticipants element for the V&V Report is identical to that described in the previous sections for the Accreditation Plan and V&V Plan.

10. Actual V&V Resources Expended

The structure of the ActualVVResourcesExpended element for the V&V Report is defined in the VVReport schema as a sequence of elements and includes an optional “heading” attribute to hold the title of the section (with default value set to “ACTUAL V&V RESOURCES EXPENDED”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- VVResourcesExpended – This element identifies the resources that were expended to accomplish the V&V activities. The structure is defined in the VVReport schema as a complex type extending xs:string (string content) with an optional “heading” attribute to hold the title of the section (with default value set to “V&V Resources Expended”).
- ActualVVMilestonesAndTimeline – This element provides a chart of when the V&V milestones were achieved within the context of the overall program timeline. The structure is defined in the VVReport schema as a complex type extending xs:string (string content) with an optional “heading” attribute to hold the title of the section (with default value set to “Actual V&V Milestones and Timeline”).

11. V&V Lessons Learned

The structure of the VVLessonsLearned element for the V&V Report is defined in the VVReport schema as a complex type extending xs:string (string content) to add an optional “heading” attribute to hold the title of the section (with default value set to “V&V LESSONS LEARNED”).

12. M&S Description

The structure of the MSDescription element for the V&V Report is identical to that described in the Accreditation Plan XML structures in the previous section.

13. M&S Requirements Traceability Matrix

The structure of the MSRequirementsTraceability element for the V&V Report is defined in the VVADocumentationBaseTypes schema by MSRequirementsTraceabilityType, described previously. In the V&V Report, the optional element VVTaskAnalyses in the VVTaskActivityType structure is populated to associate V&V task analyses with each V&V task/activity. The VVTaskAnalyses

element is defined in the VVADocumentationBaseTypes schema by VVTaskAnalysisListType, a complex type consisting of a sequence of one or more VVTaskAnalysis elements, each of which is defined by VVTaskAnalysisType as a complex type consisting of a sequence of the following child elements:

- VVTaskAnalysisNumber – This element holds a number or label identifying the V&V task analysis. The element allows text entry.
- VVTaskAnalysisDescription – This is an optional element describing a V&V task analysis. It allows text entry.
- AccreditationAssessments – This optional element is not populated in the V&V Report.

This structure supports preparation of the document through entry of data into the table previously shown in Table 8. Preparation of the V&V Report provides information on V&V task analyses in the fifth column of the M&S Requirements Traceability Matrix. Remaining content will be entered during preparation of the final document (Accreditation Report) discussed in the next section.

14. Basis of Comparison

The structure of the BasisOfComparison element for the V&V Report is identical to that previously described in the Accreditation Plan and V&V Plan.

15. References

The structure of the References element for the V&V Report is identical to that previously described in the Accreditation Plan and V&V Plan.

16. Acronyms

The structure of the Acronyms element for the V&V Report is identical to that previously described in the Accreditation Plan and V&V Plan.

17. Glossary

The structure of the Glossary element for the V&V Report is identical to that previously described in the Accreditation Plan and V&V Plan.

18. V&V Programmatic

The structure of the VVProgrammatic element for the V&V Report is defined in the VVReport schema as a complex type extending the base type ProgrammaticType to

add an optional “heading” attribute to hold the title of the section (with default value set to “V&V PROGRAMMATICS”). The ProgrammaticType is declared in the VVADocumentationBaseTypes schema as a complex type containing text content to provide detailed information regarding source allocation and funding that can be used to track VV&A expenditures (e.g., Activity, Required Resources, Funding Source, Funds by Fiscal Year and Quarter).

19. Distribution List

The structure of the DistributionList element for the V&V Report is identical to that previously described in the Accreditation Plan and V&V Plan.

20. V&V Plan

The structure of the VVPlanReference element for the V&V Report was fully defined when first introduced in this section.

21. Test Information

The structure of the TestInformation element for the V&V Report is defined in the VVReport schema as a complex type extending xs:string (string content) to add an optional “heading” attribute to hold the title of the section (with default value set to “TEST INFORMATION”).

G. ACCREDITATION REPORT SCHEMA

The Accreditation Report focuses on: (1) documenting the results of the accreditation assessment; (2) documenting the recommendations in support of the accreditation decision; and (3) documenting lessons learned during accreditation.

The root element of the Accreditation Report XML document is AccreditationReport. It has the following child elements:

- ProjectReferenceID – as described previously.
- DocumentReferenceID – as described previously.
- AccreditationReportTitlePage – This element contains title page information for the document. The element type is declared to be DocumentTitlePageType, described previously.

- RecordOfChanges – A record of changes made to evolving versions of the document. The element type is declared to be RecordOfChangesType, described previously.
- ExecutiveSummary – This element provides an overview of the Accreditation Report. The element type is declared to be xs:string base type, with an optional attribute named “heading” to hold the title of the section (with default value set to “ACCREDITATION REPORT EXECUTIVE SUMMARY”). The structure of the ExecutiveSummary element corresponds to the description provided in paragraph D.5 of MIL-STD-3022.
- ProblemStatement – This element describes the problem the M&S is expected to address. The element type is declared to be ProblemStatementType, described previously. The structure of the ProblemStatement element corresponds to the description of content provided in paragraph D.6 of MIL-STD-3022.
- MSRequirementsAcceptability – This element describes the M&S requirements defined for the intended use, the derived acceptability criteria that should be met to satisfy the requirements, the quantitative and qualitative metrics used to measure their success, and the order of their priority. The element type is declared to be MSRequirementsAcceptabilityType, described previously. The structure of the MSRequirementsAcceptability element corresponds to the description of content provided in paragraph D.7 of MIL-STD-3022.
- MSAssumptionsCapabilitiesLimitationsRisksImpacts – This element contains a description of known factors that constrain the development and/or use of the M&S or that impede the VV&A effort, including the assumptions, capabilities, limitations, and risk factors affecting M&S development and risks associated with using the M&S for the intended use. The element type is declared to be MSCharacterizationType,

described previously. The structure of the MSAssumptionsCapabilitiesLimitationsRisksImpacts element corresponds to the description of content provided in paragraph D.8 of MIL-STD-3022.

- AccreditationAssessment – This element describes the methods used in the accreditation assessment. The element structure is declared to be a complex type with child elements for text entry, accreditation information used, information collection, and assessment. This structure is described in more detail later in this section. The structure of the AccreditationAssessment element corresponds to the description of content provided in paragraph D.9 of MIL-STD-3022.
- AccreditationRecommendations – This element describes the accreditation recommendations to be forwarded to the Accreditation Authority and provides the rationale for each. The structure is defined in the VVReport schema as a complex type extending the xs:string base type to add an optional attribute named “heading” to hold the title of the section (with default value set to “ACCREDITATION RECOMMENDATIONS”). The structure of the AccreditationRecommendations element corresponds to the description of record of changes content provided in paragraph D.10 of MIL-STD-3022.
- KeyParticipants – This element identifies the participants involved in the VV&A effort as well as the roles that they are assigned and their key responsibilities within that role. The element structure is defined in the AccreditationReport schema as a complex type with child elements for text entry, accreditation participants, V&V participants, and other participants. This structure was described in detail in previous sections. The structure of the KeyParticipants element corresponds to the description of content provided in paragraph D.11 of MIL-STD-3022.
- ActualAccreditationResourcesExpended – This element identifies the resources expended during execution of the Accreditation Plan, such as

performers, man-hours, materials, and funding. The element structure is defined in the AccreditationReport schema as a complex type with child elements for text entry, accreditation resources expended, and actual accreditation milestones and timeline. This structure is described in more detail later in this section. The structure of the ActualAccreditationResourcesExpended element corresponds to the description of content provided in paragraph D.12 of MIL-STD-3022.

- AccreditationLessonsLearned – This element provides a summary of the adjustments and lessons learned during the accreditation process. The structure is defined in the AccreditationReport schema as a complex type extending the xs:string base type to add an optional attribute named “heading” to hold the title of the section (with default value set to “ACCREDITATION LESSONS LEARNED”). The structure of the AccreditationLessonsLearned element corresponds to the description of content provided in paragraph D.13 of MIL-STD-3022.
- MSDescription – This element contains pertinent detailed information about the M&S being assessed. The element type is declared to be MSDescriptionType, described previously. The structure of the MSDescription element corresponds to the description of content provided in paragraph D.14 of MIL-STD-3022.
- MSRequirementsTraceability – This element establishes links between the various M&S requirements, the acceptability criteria, and the evidence collected during the V&V processes. The element type is declared to be MSRequirementsTraceabilityType, described previously and discussed in more detail later in this section. The structure of the MSRequirementsTraceability element corresponds to the description of content provided in paragraph D.15 of MIL-STD-3022.
- BasisOfComparison – This element describes the basis of comparison used for validation. The basis of comparison serves as the reference

against which the accuracy of the M&S representations is measured. The element type is declared to be BasisOfComparisonType, described previously. The structure of the BasisOfComparison element corresponds to the description of content provided in paragraph D.16 of MIL-STD-3022.

- References – This element identifies all of the references used in the development of this document. The element type is declared to be ReferencesType, described previously. The structure of the References element corresponds to the description of content provided in paragraph D.17 of MIL-STD-3022.
- Acronyms – This element identifies all acronyms used in this document. The element type is declared to be AcronymsType, described previously. The structure of the Acronyms element corresponds to the description of content provided in paragraph D.18 of MIL-STD-3022.
- Glossary – This element contains definitions that aid in understanding the document. The element type is declared to be GlossaryType, described previously. The structure of the Glossary element corresponds to the description provided in paragraph D.19 of MIL-STD-3022.
- AccreditationProgrammatics – This element contains detailed information regarding resource allocation and funding. The element type is declared to be ProgrammaticsType, described previously, with an extension to add an optional “heading” attribute to hold the title of the section (with default value set to “ACCREDITATION PROGRAMMATICS”). The structure of the AccreditationProgrammatics element corresponds to the description of content provided in paragraph D.20 of MIL-STD-3022.
- DistributionList – This element provides the distribution list for hardcopies or digital copies of the approved document. The element type is declared to be DistributionListType, described previously. The structure

of the DistributionList element corresponds to the description of content provided in paragraph D.21 of MIL-STD-3022.

- AccreditationPlanReference – This element provides a reference to the respective M&S Accreditation Plan. The element type is declared to be an extension to the base type PriorDocumentAppendixType (defined in the VV&A Documentation Base Types schema) to add an optional “heading” attribute to hold the title of the section (with default value set to “ACCREDITATION PLAN”). The PriorDocumentAppendixType was described previously. The structure of the AccreditationPlanReference element corresponds to the description of content provided in paragraph D.22 of MIL-STD-3022.
- VVReportReference – This element provides a reference to the respective M&S V&V Report. The element type is declared to be an extension to the base type PriorDocumentAppendixType (defined in the VV&A Documentation Base Types schema) to add an optional “heading” attribute to hold the title of the section (with default value set to “V&V REPORT”). The PriorDocumentAppendixType was described previously. The structure of the VVReportReference element corresponds to the description of content provided in paragraph D.23 of MIL-STD-3022.

In the following subsections, each of these major elements of the V&V Report XML structure is described in further detail.

1. Document Title Page

The structure of the title page for the Accreditation Report is provided by the DocumentTitlePageType complex type described previously. For the Accreditation Report, the DocumentType child element will generally be set to “Accreditation Report” but the structure allows for entry of a user-specified document type.

2. Record of Changes

The structure of the Record of Changes for the Accreditation Report is provided by the RecordOfChangesType complex type described previously.

3. Accreditation Report Executive Summary

The ExecutiveSummary element was fully described above.

4. Problem Statement

The structure of the ProblemStatement element for the Accreditation Report is provided by the ProblemStatementType complex type described previously.

5. M&S Requirements and Acceptability Criteria

The structure of the MSRequirementsAcceptability element for the Accreditation Report is provided by the MSRequirementsAcceptabilityType complex type described previously.

6. M&S Assumptions, Capabilities, Limitations, & Risks/Impacts

The structure of the MSAssumptionsCapabilitiesLimitationsRisksImpacts element for the Accreditation Report is provided by the MSCharacterizationType described previously.

7. Accreditation Assessment

The structure of the AccreditationAssessment element for the Accreditation Report is defined in the AccreditationReport schema as a sequence of elements and includes an optional “heading” attribute to hold the title of the section (with default value set to “ACCREDITATION ASSESSMENT”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- AccreditationInformationUsed – This element describes the information used to conduct the accreditation assessment. The content should map to the Accreditation Information Needs subsection of the Accreditation Plan. It is defined in the AccreditationReport schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to

“Accreditation Information Used”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- InformationUsedList – This element is an optional list of one or more InformationUsedItem elements, each of which is defined in the VVADocumentationBaseTypes schema by InformationUsedItemType, a complex type consisting of a sequence of the following child elements:
 - Number – This element is a number or identifier assigned to an item of information used. It allows text entry.
 - Information – This element describes the information used. It allows text entry.

This structure supports preparation of the document through entry of data into the table shown in Table 21.

Table 21. Accreditation Information Used

#	Information Used
[enter text]	[enter text]

- InformationCollection – This element describes how, when, and from whom the information was obtained and references the appendix, document, or archive where the actual information can be found. It is defined in the AccreditationReport schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Information Collection”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
- InformationCollectionList – This element is an optional list of one or more InformationCollectionItem elements, each of which is defined in the VVADocumentationBaseTypes schema by InformationCollectionItemType, a complex type consisting of a sequence of the following child elements:
 - Number – This element is a number or identifier assigned to an item of information collected. It allows text entry.
 - Information – This element describes the information collected. It allows text entry.
 - How – This element describes how the identified information was collected. It allows text entry.
 - When – This element identifies when the information was collected. It allows text entry.
 - FromWhom – This element identifies from whom the information was collected. It allows text entry.
 - AppendixDocumentArchive – This element identifies where the actual information can be found. It allows text entry.

This structure supports preparation of the document through entry of data into the table shown in

Table 22.

Table 22. Information Collection

#	Information	How	When	From Whom	Appendix, Document, or Archive
[enter text]					

- Assessment – This element describes the assessment events, including the assessment techniques used, participants involved, milestones achieved, and results of the assessment events. It is defined in the AccreditationReport schema as a complex type consisting of a sequence of child elements and an optional “heading” attribute to hold the title of the section (with default value set to “Assessment”). The child elements include the following:
 - TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).
 - AssessmentList – This element is an optional list of one or more AssessmentItem elements, each of which is defined in the VVADocumentationBaseTypes schema by AssessmentItemType, a complex type consisting of a sequence of the following child elements:
 - Number – This element is a number or identifier assigned to an assessment item. It allows text entry.
 - CriterionNumber – This element provides a reference to an acceptability criterion. It allows text entry.
 - DataVerificationTaskAnalysisNumber – This element is a reference to a data verification task analysis.

- DataValidationTaskAnalysisNumber – This element is a reference to a data validation task analysis.
- AssessmentDescriptionNumber – This element is a number or identifier of the assessment item.
- AssessmentDescription – This element provides a description of the assessment event.

This structure supports preparation of the document through entry of data into the table shown in Table 23.

Table 23. Accreditation Assessment

REQ#	AC#	DVETA#	DVATA#	AD#	Assessment Description
[from Sec 2]	[from Sec 2]	[from V&V Rpt]	[from V&V Rpt]	[enter text]	[enter text]

8. Accreditation Recommendations

The structure of the AccreditationRecommendations element for the Accreditation Report is defined in the AccreditationReport schema as a complex type extending xs:string (string content) to add an optional “heading” attribute to hold the title of the section (with default value set to “ACCREDITATION RECOMMENDATIONS”).

9. Key Participants

The structure of the KeyParticipants element for the Accreditation Report is identical to that described in the previous sections for the Accreditation Plan, V&V Plan, and V&V Report.

10. Actual Accreditation Resources Expended

The structure of the ActualAccreditationResourcesExpended element for the Accreditation Report is defined in the AccreditationReport schema as a sequence of elements and includes an optional “heading” attribute to hold the title of the section (with default value set to “ACTUAL ACCREDITATION RESOURCES EXPENDED”). The child elements include the following:

- TextEntry – This element contains text information introducing this section of the document. It is defined by simple type TextEntryType

defined in the VVADocumentationBaseTypes schema. TextEntryType is defined as xs:string, allowing a minimum length of 0 (i.e., the text entry can be empty).

- AccreditationResourcesExpended – This element identifies the resources expended during execution of the Accreditation Plan, such as performers, man-hours, materials, and funding. The structure is defined in the AccreditationReport schema as a complex type extending xs:string (string content) with an optional “heading” attribute to hold the title of the section (with default value set to “Accreditation Resources Expended”).
- ActualAccreditationMilestonesAndTimeline – This element provides a chart of when the accreditation milestones were achieved within the context of the overall program timeline. The structure is defined in the AccreditationReport schema as a complex type extending xs:string (string content) with an optional “heading” attribute to hold the title of the section (with default value set to “Actual Accreditation Milestones and Timeline”).

11. Accreditation Lessons Learned

The structure of the AccreditationLessonsLearned element for the Accreditation Report is defined in the AccreditationReport schema as a complex type extending xs:string (string content) to add an optional “heading” attribute to hold the title of the section (with default value set to “ACCREDITATION LESSONS LEARNED”).

12. M&S Description

The structure of the MSDescription element for the Accreditation Report is identical to that described for the other documents.

13. M&S Requirements Traceability Matrix

The structure of the MSRequirementsTraceability element for the Accreditation Report is defined in the VVADocumentationBaseTypes schema by MSRequirementsTraceabilityType, described previously. In the Accreditation Report, the optional element AccreditationAssessments in the VVTaskAnalysisType structure is populated to describe the accreditation assessment for each V&V task analysis. The

AccreditationAssessments element is defined in the VVADocumentationBaseTypes schema by AccreditationAssesmentsType, a complex type consisting of a sequence of one or more AccreditationAssessment elements, each of which is defined by AccreditationAssessmentType as a complex type consisting of a sequence of the following child elements:

- AccreditationAssessmentNumber – This element holds a number or identifier of the accreditation assessment. The element allows text entry.
- AccreditationAssessmentDescription – This element provides a description of the accreditation assessment. It allows text entry.

This structure supports preparation of the document through entry of data into the table previously shown in Table 8. Preparation of the Accreditation Report provides information on accreditation assessments in the fifth column of the M&S Requirements Traceability Matrix. This completes the content of the Requirements Traceability Matrix.

14. Basis of Comparison

The structure of the BasisOfComparison element for the Accreditation Report is identical to that previously described in the other documents.

15. References

The structure of the References element for the Accreditation Report is identical to that previously described in the other documents.

16. Acronyms

The structure of the Acronyms element for the Accreditation Report is identical to that previously described in the other documents.

17. Glossary

The structure of the Glossary element for the Accreditation Report is identical to that previously described in the other documents.

18. Accreditation Programmatic

The structure of the AccreditationProgrammatic element for the Accreditation Report is defined in the AccreditationReport schema as a complex type extending the base type ProgrammaticType to add an optional “heading” attribute to hold the title of the section (with default value set to “ACCREDITATION PROGRAMMATIC”). The

ProgrammaticsType is declared in the VVADocumentationBaseTypes schema as a complex type containing text content to provide detailed information regarding source allocation and funding that can be used to track VV&A expenditures (e.g., Activity, Required Resources, Funding Source, Funds by Fiscal Year and Quarter).

19. Distribution List

The structure of the DistributionList element for the Accreditation Report is identical to that previously described in the other documents.

20. Accreditation Plan

The structure of the AccreditationPlanReference element for the Accreditation Report was fully defined when first introduced in this section.

21. V&V Report

The structure of the VVReportReference element for the Accreditation Report was fully defined when first introduced in this section.

H. SUMMARY

This chapter provided a detailed description of the XML structures defined for the base types and individual VV&A document schemas. A complete listing of the schemas is provided in the appendixes.

IV. GENERATION OF VV&A DOCUMENTATION METADATA

A. INTRODUCTION

This chapter discusses the mapping from VV&A documentation project-level and document-level XML documents to generate metadata conforming to the MSC-DMS.

B. MAPPING FROM VV&A DOCUMENTS TO VV&A DOCUMENTATION METADATA SET

The MSC-DMS was developed to standardize metadata descriptions of M&S resources. An XML document conforming to the VV&A Documentation Metadata Set schema is automatically generated from each VV&A Document XML file. The initial concern is to provide sufficient metadata to obtain an XML file conforming to the MSC-DMS XML schema. Table 24 identifies the minimal set of metadata required by the MSC-DMS schema to create a valid (in XML sense) XML document (i.e., one that validates against the MSC-DMS schema) and indicates the provides the mapping from a VV&A Document XML file to the VV&A Documentation Metadata Set file. In addition to the minimal set required, VV&A coverage extensions are shown since these are desired in MSC-DMS metadata describing VV&A resources.

Table 24. Mapping of VV&A Documentation Project-Level and Document-Level Metadata to MSC-DMS Content

Required MSC-DMS Content	From VV&A Documentation Project-Level Metadata	From VV&A Document-Level Metadata
Resource/ Title/@value	ProjectTitle element	Document Title Page DocumentTitle element content
Resource/ Type/@value	Default: "VV&A Documentation Project"	Document Title Page DocumentType element content
Resource/ Description/Text	Comment element	Document Title Page DocumentType element content
Resource/ Dates/Date/@type	Default: "created"	Default: "created"
Resource/ Dates/Date/@value	SubmissionDate element	Document Title Page DocumentDate element content
Resource/ Version/@value	Default: "N/A"	Document Title Page DocumentVersion element content
Resource/	Default: "A: Unlimited	Document Title Page

Required MSC-DMS Content	From VV&A Documentation Project-Level Metadata	From VV&A Document-Level Metadata
Releasability/@value	distribution”	DistributionStatement element content
Resource/ POCs/POC/Role/@value	Default: “primary author”	Default: “primary author”
Resource/ POCs/POC/Person/Name/@first	Parse from Submitter element content	Parse from Document Title Page DocumentPreparer element content
Resource/ POCs/POC/Person/Name/@last	Parse from Submitter element content	Parse from Document Title Page DocumentPreparer element content
Resource/ POCs/POC/Person/AddressInfo	Parse from Submitter element content	Obtain from tool registration information
Resource/ POCs/POC/Person/Phone/@type	Default: “work”	Default: “work”
Resource/ POCs/POC/Person/ Phone/@number	Parse from Submitter element content	Obtain from tool registration information
Resource/ POCs/POC/Person/Email/@type	Default: “work”	Default: “work”
Resource/ POCs/POC/Person/Email/@address	Parse from Submitter element content	Obtain from tool registration information
Resource/ Keywords/Keyword/@value	Default: “Verification”, “Validation”, “Accreditation”, “Modeling”, “Simulation”	Document Title Page DocumentType element content
Resource/ Extensions/VVACoverage/Type/@value	Default: “VV&A Documentation Project”	Default: “VV&A Documentation Project”
Resource/ Extensions/VVACoverage/Type/@subtype	Not used	Document Title Page DocumentType element content
Resource/ Extensions/VVACoverage/IntendedUse	MSSystem/IntendedUse element content	ProblemStatement/IntendedUse element content
Resource/ Extensions/VVACoverage/ExecutiveSummary	Default: “VV&A documentation project initiation..”	VV&A Document ExecutiveSummary element content
Resource/ Extensions/VVACoverage/POC	Parse from Submitter element content	Document Title Page DocumentPreparer element content

Note that there are three ways that MSC-DMS metadata would be applied: (1) to describe a VV&A documentation project as an M&S resource; (2) to describe one of the four VV&A documents as an M&S resource; (3) as supplemental VV&A information on an M&S resource (in this case, it is also possible to reference VV&A documents associated with an M&S resource in the MSC-DMS Associations element). The DVDT

will generate MSC-DMS content for the first and second cases; other tools used for management/development of the M&S system would need to add applicable VV&A information when generating MSC-DMS content for the third case. In later versions of DVDT development, the GUI and supporting XML schema need to incorporate data structures that are more fully aligned with the MSC-DMS structures to help simplify generation of the required metadata content.

C. SUMMARY

This chapter identified the mappings from VV&A project-level and document-level XML documents to generate metadata descriptions that conform to the MSC-DMS. These mappings can be used in designing software or in creating XSLT files to automatically generate the MSC-DMS metadata from the source VV&A documents.

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V. RECOMMENDATIONS AND SUMMARY

A. RECOMMENDATIONS FOR FUTURE WORK

During late stages of development of the initial version of the DVDT, a decision was made to simplify the XML schema designs by removing references to external XML schemas; specifically, the MSC-DMS XML schema. The MSC-DMS requires some additional detail in certain metadata content that is not available from the data entered via the tool. Direct reference to data types defined in the MSC-DMS simplifies generation of MSC-DMS conformant metadata documents from the content of the VV&A documentation XML documents; but also ties maintenance of the VV&A documentation schemas and the DVDT to evolution of the MSC-DMS XML schemas. This is not necessarily a desirable consequence. Perhaps it is better to have only the XSLT be dependent on the design and development of the MSC-DMS XML schemas and keep the DVDT more independent. This issue needs to be resolved in subsequent versions of the VV&A documentation schemas. In the meantime, the initial XSLT provided with this report meet the need of generating MSC-DMS conforming metadata from the VV&A documentation.

Ongoing refinement of the XML schemas needs to consider conventions and best practices defined in emerging XML Naming and Design Rules, such as the current version from the Department of the Navy (Department of the Navy, 2005). Adherence to these rules is expected to provide greater longterm maintainability and reusability of information structures defined in the VV&A documentation schemas.

The present schema design begins to move from the traditional notion of documentation consisting of narrative paragraphs to more explicit specification of key items of information from which narrative paragraphs can be constructed. The accumulation of data into a narrative document, such as the VV&A documents described by the standard templates, is a *presentation* issue; i.e., how the data are presented for a particular purpose. Given well-structured, well-defined data, there can be a multitude of presentation styles for different purposes, from traditional documents to relational data base tables to Excel spreadsheets to stylized web pages. Consider, for example, the

Executive Summary of an Accreditation Report. Currently it is stored in this initial draft of the XML schema design as a narrative paragraph (or paragraphs); that is, free text prose. Clearly, there is particular information that should be provided in the Executive Summary. The MIL-STD-3302 states that the Executive Summary “should be a synopsis... of the major elements from all sections of the document, with emphasis on accreditation scope, M&S requirements, acceptability criteria, accreditation methodology, and accreditation issues.” Since these aspects of the Executive Summary are all stored in other parts of the Accreditation Plan, it may be feasible to auto-generate the Executive Summary from data stored in other parts of the Accreditation Plan XML document. It is not clear, however, how the data would be “synopsized” for summary purposes. This is an area for further study as the enterprise moves from presentation-centric documentation to data-centric documentation that better serves the network-centric architecture.

In the future, the content of the VV&A documents will be stored as knowledge bases where document content becomes explicit statements or assertions about the M&S product and the VV&A activities performed on that product. The document content will be associated with web resources in the networked information architecture, by which the “document” will only exist in a virtual sense. The various content elements will be accessible through Uniform Resource Identifiers (URI) and brought together into various views or presentations of the information when needed. A small start in this direction is indicated in our use of a URI reference for inclusion of the V&V Plan in the V&V Report and inclusion of the Accreditation Plan and V&V Report in the Accreditation Report. These should be provided by reference rather than by inclusion of content in the respective XML files.

B. SUMMARY

This report described a collection of Extensible Markup Language (XML) schemas developed to support the DVDT project. The schemas include one for project-level metadata and one for each of the standard VV&A documents, namely: Accreditation Plan, V&V Plan, V&V Report, and Accreditation Report. The data

structures are used to generate metadata conforming to the M&S Community of Interest Discovery Metadata Specification for enterprise discovery of VV&A information.

The current version of the schemas for standardized VV&A documentation provides a structural shell for storing content of the VV&A documents and provide the basis for generation of metadata supporting resource discovery in the Global Information Grid. Additional work is required to provide more precise restrictions on data content to assist the user in creating meaningful content. However, as currently defined, the schemas provide a basis for DVDT development. Future work will also explore specification and collection of stronger semantic descriptions of VV&A information to enable more effective search and automated reasoning with that information.

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APPENDIX A. VV&A DOCUMENTATION BASE TYPES XML SCHEMA

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- edited with XMLSpy v2008 (http://www.altova.com) by Curtis Blais (Naval Postgraduate School) -->
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns="http://metadata.dod.mil/mdr/ns/VVADocumentation/1.0"
targetNamespace="http://metadata.dod.mil/mdr/ns/VVADocumentation/1.0"
elementFormDefault="qualified" attributeFormDefault="unqualified" version="0.4">
  <xs:annotation>
```

This XML Schema file provides a definition of data types and element structures used as building blocks for storing the content of the four major VV&A documents developed for Modeling and Simulation (M&S) resources. The data types defined here are referenced in two or more XML schemas describing the content of the VV&A documents described in reference [1]; namely: Accreditation Plan; V&V Plan, V&V Report, and Accreditation Report.

Where applicable, complex and simple data types from schemas for DoD discovery metadata [2] and M&S Community of Interest discovery metadata [3] will be referenced in future versions of this schema.

[1] Department of Defense Standard Practice: Documentation of Verification, Validation and Accreditation (VV&A) for Models and Simulations, MIL-STD-3022, 28 January 2008. This standard establishes templates for the four core products of the M&S VV&A processes. The templates provide a common framework and interfacing capability between the four documents and support consistency and efficiency.

[2] Department of Defense: Department of Defense Discovery Metadata Specification (DDMS), Version 1.4.1, dated 10 August 2007.

[3] Modeling & Simulation Coordination Office: Modeling & Simulation Community of Interest Discovery Metadata Specification, document version 1.0.1 dated 1/22/2008 and v1.0.2 schemas dated 4/29/2008 and 5/21/2008.

```
]]></xs:documentation>
<xs:documentation><![CDATA[
Change Log:
Author Date
Change
]]></xs:documentation>
```

```
</xs:annotation>
<!-- *** IMPORT/INCLUDE NEEDED SCHEMAS/NAMESPACES *** -->
<!-- ***** -->
<!-- ***** Define VVA Documentation Metadata Elements ***** -->
<!-- ***** -->
```

```
<xs:complexType name="MSSystemType">
  <xs:annotation>
    <xs:documentation><![CDATA[Information about the M&S system addressed
by the VV&A documentation project.]]></xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="MSTitle" type="xs:string">
      <xs:annotation>
        <xs:documentation><![CDATA[Identification of the M&S
system. Required DVDT user entry.]]></xs:documentation>
      </xs:annotation>
    </xs:element>
```

```

        <xs:element name="Version" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Version number of the M&S
system. Required DVDT user entry.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="IntendedUse" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Description of the intended
use of the M&S system helping to define the context and scope of the VV&A documentation effort.
Required DVDT user entry.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<!-- ***** -->
<!-- ***** Define VVA Document Content Elements ***** -->
<!-- ***** -->
<!-- Define VVA Documentation Content Elements -->
<xs:complexType name="AccreditationAssessmentType">
    <xs:sequence>
        <xs:element name="AccreditationAssessmentNumber"/>
        <xs:element name="AccreditationAssessmentDescription" minOccurs="0"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="AccreditationAssessmentsType">
    <xs:sequence>
        <xs:element name="AccreditationAssessment"
type="AccreditationAssessmentType" maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="AcceptabilityCriterionType">
    <xs:sequence>
        <xs:element name="CriterionNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation>Number or identifier assigned to an
acceptability criterion.</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="Criterion" type="xs:string" minOccurs="0">
            <xs:annotation>
                <xs:documentation>Optional statement of a
criterion.</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="MetricsOrMeasures" type="MetricsOrMeasuresType">
            <xs:annotation>
                <xs:documentation>Metrics or measures (one or more)
associated with an acceptability criterion.</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="VVTasksActivities" type="VVTasksActivitiesType"
minOccurs="0">
            <xs:annotation>

```

```

                                <xs:documentation>Tasks and activities associated with
verification and validation of a requirement.</xs:documentation>
                                </xs:annotation>
                                </xs:element>
                                </xs:sequence>
                                </xs:complexType>
                                <xs:complexType name="AcronymsType">
                                <xs:annotation>
                                <xs:documentation><![CDATA[Identifies all acronyms used in the
document.]]></xs:documentation>
                                </xs:annotation>
                                <xs:simpleContent>
                                <xs:extension base="xs:string">
                                <xs:attribute name="heading" type="xs:string" use="optional"
default="ACRONYMS"/>
                                </xs:extension>
                                </xs:simpleContent>
                                </xs:complexType>
                                <xs:complexType name="AssessmentItemType">
                                <xs:annotation>
                                <xs:documentation>Describes assessment events, including assessment
techniques used, participants involved, milestones achieved, and the results of the assessment
events.</xs:documentation>
                                </xs:annotation>
                                <xs:sequence>
                                <xs:element name="Number">
                                <xs:annotation>
                                <xs:documentation>Number or identifier assigned to an
assessment item.</xs:documentation>
                                </xs:annotation>
                                </xs:element>
                                <xs:element name="CriterionNumber">
                                <xs:annotation>
                                <xs:documentation>Reference to an acceptability
criterion.</xs:documentation>
                                </xs:annotation>
                                </xs:element>
                                <xs:element name="DataVerificationTaskAnalysisNumber">
                                <xs:annotation>
                                <xs:documentation>Reference to a data verification task
analysis.</xs:documentation>
                                </xs:annotation>
                                </xs:element>
                                <xs:element name="DataValidationTaskAnalysisNumber">
                                <xs:annotation>
                                <xs:documentation>Reference to a data validation task
analysis.</xs:documentation>
                                </xs:annotation>
                                </xs:element>
                                <xs:element name="AssessmentDescriptionNumber">
                                <xs:annotation>
                                <xs:documentation>Number or ID of the assessment
description.</xs:documentation>
                                </xs:annotation>
                                </xs:element>

```

```

        <xs:element name="AssessmentDescription">
            <xs:annotation>
                <xs:documentation>Description of the assessment
event.</xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="AssessmentPlanType">
    <xs:annotation>
        <xs:documentation>Describes the assessment events, including the assessment
techniques to be used, the specific roles and responsibilities of the participants, the milestones to be
achieved, and the products to be produced.</xs:documentation>
    </xs:annotation>
    <xs:simpleContent>
        <xs:extension base="xs:string">
            <xs:attribute name="heading" type="xs:string" use="optional"
default="Assessment Plan"/>
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>
<xs:complexType name="AuthoritativeResourceType">
    <xs:annotation>
        <xs:documentation>Name and contact information for an authoritative resource
(Subject Matter Expert).</xs:documentation>
    </xs:annotation>
    <xs:choice>
        <xs:element name="SME" type="SMEType"/>
        <xs:element name="ReferenceDocument" type="xs:string"/>
        <xs:element name="ReferenceData" type="xs:string"/>
    </xs:choice>
</xs:complexType>
<xs:complexType name="BasisOfComparisonType">
    <xs:annotation>
        <xs:documentation><![CDATA[Describes the basis of comparison used for
validation. The basis for comparison serves as the reference against which the accuracy of the M&S
representations is measured. The basis of comparison can come in many forms, such as the results of
experiments, theory developed from experiments, validated results from other M&S, and expert knowledge
obtained through research or from SMEs.]]></xs:documentation>
    </xs:annotation>
    <xs:simpleContent>
        <xs:extension base="xs:string">
            <xs:attribute name="heading" type="xs:string" use="optional"
default="BASIS OF COMPARISON"/>
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>
<xs:complexType name="ConceptualModelValidationTaskActivityType">
    <xs:sequence>
        <xs:element name="RequirementNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Reference to an M&S
requirement.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>

```

```

        <xs:element name="CriterionNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Reference to an M&S
acceptability criterion.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="ConceptualModelValidationTaskActivityNumber"
type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Number or ID for the
conceptual model validation task/activity.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="ConceptualModelValidationTaskActivityDescription"
type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Description of the conceptual
model validation task/activity.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="AuthoritativeResource"
type="AuthoritativeResourceType"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="ConceptualModelValidationTaskAnalysisItemType">
    <xs:sequence>
        <xs:element name="RequirementNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Reference to an M&S
requirement.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="CriterionNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Reference to an M&S
acceptability criterion.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="ConceptualModelValidationTaskActivityNumber"
type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Number or ID for the
conceptual model validation task/activity.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="ConceptualModelValidationTaskAnalysisNumber"
type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Number or ID for the
conceptual model validation task analysis.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="ConceptualModelValidationTaskAnalysisDescription"
type="xs:string">
            <xs:annotation>

```

```

        <xs:documentation><![CDATA[Description of the conceptual
model validation task analysis.]]></xs:documentation>
        </xs:annotation>
    </xs:element>
</xs:sequence>
</xs:complexType>
<xs:complexType name="ContactInformationType">
    <xs:sequence>
        <xs:element name="Organization"/>
        <xs:element name="Email"/>
        <xs:element name="Phone"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="DataValidationTaskActivityType">
    <xs:sequence>
        <xs:element name="RequirementNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Reference to an M&S
requirement.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="CriterionNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Reference to an M&S
acceptability criterion.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="DataValidationTaskActivityNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Number or ID for the data
validation task/activity.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="DataValidationTaskActivityDescription" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Description of the data
validation task/activity.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="DataValidationTaskAnalysisItemType">
    <xs:sequence>
        <xs:element name="RequirementNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Reference to an M&S
requirement.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="CriterionNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Reference to an M&S
acceptability criterion.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>

```

```

        <xs:element name="DataValidationTaskActivityNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Number or ID for the data
validation task/activity.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="DataValidationTaskAnalysisNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Number or ID for the data
validation task analysis.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="DataValidationTaskAnalysisDescription" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Description of the data
validation task analysis.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="DataVerificationTaskActivityType">
    <xs:sequence>
        <xs:element name="RequirementNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Reference to an M&S
requirement.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="CriterionNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Reference to an M&S
acceptability criterion.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="DataVerificationTaskActivityNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Number or ID for the data
verification task/activity.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="DataVerificationTaskActivityDescription"
type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Description of the data
verification task/activity.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="DataVerificationTaskAnalysisItemType">
    <xs:sequence>
        <xs:element name="RequirementNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Reference to an M&S
requirement.]]></xs:documentation>

```

```

        </xs:annotation>
      </xs:element>
      <xs:element name="CriterionNumber" type="xs:string">
        <xs:annotation>
          <xs:documentation><![CDATA[Reference to an M&S
acceptability criterion.]]></xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="DataVerificationTaskActivityNumber" type="xs:string">
        <xs:annotation>
          <xs:documentation><![CDATA[Number or ID for the data
verification task/activity.]]></xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="DataVerificationTaskAnalysisNumber" type="xs:string">
        <xs:annotation>
          <xs:documentation><![CDATA[Number or ID for the data
verification task analysis.]]></xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="DataVerificationTaskAnalysisDescription"
type="xs:string">
        <xs:annotation>
          <xs:documentation><![CDATA[Description of the data
verification task analysis.]]></xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="DesignVerificationTaskActivityType">
    <xs:sequence>
      <xs:element name="RequirementNumber" type="xs:string">
        <xs:annotation>
          <xs:documentation><![CDATA[Reference to an M&S
requirement.]]></xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="CriterionNumber" type="xs:string">
        <xs:annotation>
          <xs:documentation><![CDATA[Reference to an M&S
acceptability criterion.]]></xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="DesignVerificationTaskActivityNumber" type="xs:string">
        <xs:annotation>
          <xs:documentation><![CDATA[Number or ID for the M&S
design verification task/activity.]]></xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="ConceptualModelSegment" type="xs:string">
        <xs:annotation>
          <xs:documentation><![CDATA[Identification of the relevant
conceptual model segment.]]></xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:complexType>

```

```

        <xs:element name="DesignSegment" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Identification of the relevant
design segment.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="ApplicableReferences" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Identification of the
applicable standards, codes, or best practices relevant to the M&S design verification
task/activity.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="Adherence" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[How to evaluate adherence to
the applicable reference for the design verification task/activity.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="DesignVerificationTaskAnalysisItemType">
    <xs:sequence>
        <xs:element name="RequirementNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Reference to an M&S
requirement.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="CriterionNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Reference to an M&S
acceptability criterion.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="DesignVerificationTaskActivityNumber" type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Number or ID for the M&S
design verification task/activity.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="DesignVerificationTaskAnalysisNumber"
type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Number or ID for the design
verification task analysis.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="DesignVerificationTaskAnalysisDescription"
type="xs:string">
            <xs:annotation>
                <xs:documentation><![CDATA[Description of the design
verification task analysis.]]></xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>

```

```

        </xs:sequence>
    </xs:complexType>
    <xs:complexType name="DistributionListType">
        <xs:annotation>
            <xs:documentation><![CDATA[Identifies individuals and organizations to
whom the VV&A document is to be provided.]]></xs:documentation>
        </xs:annotation>
        <xs:simpleContent>
            <xs:extension base="xs:string">
                <xs:attribute name="heading" type="xs:string" use="optional"
default="DISTRIBUTION LIST"/>
            </xs:extension>
        </xs:simpleContent>
    </xs:complexType>
    <xs:complexType name="DocumentTitlePageType">
        <xs:annotation>
            <xs:documentation>Title page information for the
document.</xs:documentation>
        </xs:annotation>
        <xs:sequence>
            <xs:element name="ProgramIdentification" type="xs:string">
                <xs:annotation>
                    <xs:documentation>Identifies the program, project, exercise,
or study indicating the context for this document.</xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="SponsoringOrganizationOrPM" type="xs:string">
                <xs:annotation>
                    <xs:documentation>Identifies the sponsoring organization or
program manager for the document.</xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="MSName" type="xs:string">
                <xs:annotation>
                    <xs:documentation>Identifies the model or simulation serving
as the context for the document.</xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="MSVersion" type="xs:string">
                <xs:annotation>
                    <xs:documentation>Identifies the version of the model or
simulation addressed by the document.</xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="DocumentType">
                <xs:annotation>
                    <xs:documentation>Identifies the type of document
(Accreditation Plan, Verification and Validation Plan, Verification and Validation Report, Accreditation
Report).</xs:documentation>
                </xs:annotation>
            </xs:element>
        </xs:sequence>
    </xs:complexType>
    <xs:simpleContent>
        <xs:extension base="DocumentType">
            <xs:attribute
name="userEnteredDocumentType" type="xs:string" use="optional" default="document type"/>
        </xs:extension>
    </xs:simpleContent>

```

```

        </xs:extension>
        </xs:simpleContent>
    </xs:complexType>
</xs:element>
<xs:element name="DocumentTitle" type="xs:string">
    <xs:annotation>
        <xs:documentation>Title of the
document.</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="DocumentVersion" type="xs:string">
    <xs:annotation>
        <xs:documentation>Identifies the version of the
document.</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="DocumentDate" type="xs:string">
    <xs:annotation>
        <xs:documentation>Identifies the date of document creation
or modification.</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="DocumentPreparer" type="xs:string">
    <xs:annotation>
        <xs:documentation>Identifies the preparer of the
document.</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="DistributionStatement" type="xs:string">
    <xs:annotation>
        <xs:documentation>Identifies the distribution directive for the
document.</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="Security" type="xs:string">
    <xs:annotation>
        <xs:documentation>Identifies security information (e.g.,
classification) for the document.</xs:documentation>
    </xs:annotation>
</xs:element>
</xs:sequence>
</xs:complexType>
<xs:complexType name="GlossaryType">
    <xs:annotation>
        <xs:documentation><![CDATA[Contains definitions that aid in the
understanding of the document.]]></xs:documentation>
    </xs:annotation>
    <xs:simpleContent>
        <xs:extension base="xs:string">
            <xs:attribute name="heading" type="xs:string" use="optional"
default="GLOSSARY"/>
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>
<xs:complexType name="ImplementationVerificationTestAnalysisItemType">

```

```

    <xs:sequence>
      <xs:group ref="TestDescription"/>
      <xs:group ref="TestOutcomes"/>
      <xs:element name="VerificationTechnique" type="xs:string"/>
      <xs:group ref="TestAssessment"/>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="ImplementationVerificationTestType">
    <xs:annotation>
      <xs:documentation>Description of implementation verification
tests.</xs:documentation>
    </xs:annotation>
    <xs:sequence>
      <xs:group ref="TestDescription"/>
      <xs:group ref="TestSetup"/>
      <xs:element name="VerificationTechnique" type="xs:string">
        <xs:annotation>
          <xs:documentation>Verification technique to be used for the
test.</xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="InformationCollectionItemType">
    <xs:annotation>
      <xs:documentation>Describes information obtained.</xs:documentation>
    </xs:annotation>
    <xs:sequence>
      <xs:element name="Number">
        <xs:annotation>
          <xs:documentation>Number or identifier assigned to an item
of information collected.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="Information">
        <xs:annotation>
          <xs:documentation>Describes the information
collected.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="How">
        <xs:annotation>
          <xs:documentation>Describes how the identified information
was collected.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="When">
        <xs:annotation>
          <xs:documentation>Identifies when the identified information
was collected.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="FromWhom">
        <xs:annotation>

```

```

        <xs:documentation>Identifies from whom the identified
information was collected.</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="AppendixDocumentArchive">
        <xs:annotation>
            <xs:documentation>Identifies where the actual information
can be found.</xs:documentation>
        </xs:annotation>
    </xs:element>
</xs:sequence>
</xs:complexType>
<xs:complexType name="InformationCollectionPlanType">
    <xs:annotation>
        <xs:documentation>Describes how, when, and from whom the information is to
be obtained, the form in which the information is to be provided, and the priority of each
item.</xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="TextEntry" type="TextEntryType"/>
        <xs:element name="InformationToCollect" type="InformationToCollectType"
minOccurs="0" maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation>Describes individual information
collection activities.</xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
    <xs:attribute name="heading" type="xs:string" use="optional" default="Information
Collection Plan"/>
</xs:complexType>
<xs:complexType name="InformationNeedsType">
    <xs:annotation>
        <xs:documentation><![CDATA[Common to Accreditation Plan and
Accreditation Report templates. Describes the information needed to conduct the accreditation assessment,
e.g., the information expected from the V&V effort, information expected from the development testing
effort, information from the M&S developers, and information from the application. Document section
contains text and an optional table identifying needed information.]]></xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="TextEntry" type="TextEntryType"/>
        <xs:element name="InformationNeed" type="InformationNeedType"
minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="heading" type="xs:string" use="optional" default="Accreditation
Information Needs"/>
</xs:complexType>
<xs:complexType name="InformationNeedType">
    <xs:sequence>
        <xs:element name="Number">
            <xs:annotation>
                <xs:documentation>Number or identifier of an information
need.</xs:documentation>
            </xs:annotation>
        </xs:element>

```

```

        <xs:element name="InformationNeeded">
            <xs:annotation>
                <xs:documentation>Description of an information
need.</xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="InformationToCollectType">
    <xs:sequence>
        <xs:element name="Number">
            <xs:annotation>
                <xs:documentation>Number or identifier assigned to a
collection plan activity for a specific information need.</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="Information" minOccurs="0">
            <xs:annotation>
                <xs:documentation>Describes the information associated with
a collection plan activity.</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="How">
            <xs:annotation>
                <xs:documentation>Describes how the identified information
is to be collected.</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="When">
            <xs:annotation>
                <xs:documentation>Identifies when the identified information
is to be collected.</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="FromWhom">
            <xs:annotation>
                <xs:documentation>Identifies from whom the identified
information is to be collected.</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="Form">
            <xs:annotation>
                <xs:documentation>Identifies the form the information will be
obtained.</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="Priority">
            <xs:annotation>
                <xs:documentation>Identifies the priority assigned to the
collection plan activity for a specific information need.</xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="InformationUsedItemType">

```

```

        <xs:annotation>
          <xs:documentation>Describes information used to conduct the accreditation
assessment.</xs:documentation>
        </xs:annotation>
      </xs:sequence>
      <xs:element name="Number">
        <xs:annotation>
          <xs:documentation>Number or identifier assigned to an item
of information used.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="Information">
        <xs:annotation>
          <xs:documentation>Describes the information
used.</xs:documentation>
        </xs:annotation>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="IntendedUseType">
    <xs:simpleContent>
      <xs:extension base="xs:string">
        <xs:attribute name="heading" type="xs:string" use="optional"
default="Intended Use"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
  <xs:complexType name="LessonsLearnedType">
    <xs:annotation>
      <xs:documentation><![CDATA[Lessons learned from the V&V
effort.]]></xs:documentation>
    </xs:annotation>
    <xs:sequence>
      <xs:element name="TextEntry" type="TextEntryType"/>
      <xs:element name="LessonLearned" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:complexType>
  <xs:complexType name="MethodologyType">
    <xs:annotation>
      <xs:documentation><![CDATA[Accreditation methodology in the
Accreditation Plan; V&V methodology in the V&V Plan.]]></xs:documentation>
    </xs:annotation>
  </xs:complexType>
  <xs:complexType name="MetricOrMeasureType">
    <xs:sequence>
      <xs:element name="MetricOrMeasureNumber" type="xs:string">
        <xs:annotation>
          <xs:documentation>Number or identifier assigned to a metric
or measure associated with an acceptability criterion.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="MeasureOrMetricDescription" type="xs:string"
minOccurs="0">
        <xs:annotation>

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                                <xs:documentation>Optional description of a metric or
measure.</xs:documentation>
                                </xs:annotation>
                                </xs:element>
                                </xs:sequence>
                                </xs:complexType>
                                <xs:complexType name="MetricsOrMeasuresType">
                                <xs:annotation>
                                <xs:documentation>Data structure for a list of metrics or measures associated
with an acceptability criterion.</xs:documentation>
                                </xs:annotation>
                                <xs:sequence>
                                <xs:element name="MetricOrMeasure" type="MetricOrMeasureType"
maxOccurs="unbounded">
                                <xs:annotation>
                                <xs:documentation>Individual metric or measure associated
with an acceptability criterion.</xs:documentation>
                                </xs:annotation>
                                </xs:element>
                                </xs:sequence>
                                </xs:complexType>
                                <xs:complexType name="MSAcceptabilityCriteriaType">
                                <xs:annotation>
                                <xs:documentation>Data structure for a list of acceptability
criteria.</xs:documentation>
                                </xs:annotation>
                                <xs:sequence>
                                <xs:element name="AcceptabilityCriterion" type="AcceptabilityCriterionType"
maxOccurs="unbounded">
                                <xs:annotation>
                                <xs:documentation>Individual acceptability criterion assigned
to a requirement.</xs:documentation>
                                </xs:annotation>
                                </xs:element>
                                </xs:sequence>
                                </xs:complexType>
                                <xs:complexType name="MSCharacterizationType">
                                <xs:annotation>
                                <xs:documentation/>
                                </xs:annotation>
                                <xs:sequence>
                                <xs:element name="TextEntry" type="TextEntryType"/>
                                <xs:element name="MSAssumptions">
                                <xs:annotation>
                                <xs:documentation><![CDATA[Describes the known
assumptions about the M&S and the data used in support of the M&S in the context of the
problem.]]></xs:documentation>
                                </xs:annotation>
                                </xs:complexType>
                                <xs:simpleContent>
                                <xs:extension base="xs:string">
                                <xs:attribute name="heading"
type="xs:string" use="optional" default="M&S Assumptions"/>
                                </xs:extension>
                                </xs:simpleContent>

```

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        </xs:complexType>
    </xs:element>
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        <xs:annotation>
            <xs:documentation><![CDATA[Describes the known
capabilities of the M&S.]]></xs:documentation>
        </xs:annotation>
        <xs:complexType>
            <xs:simpleContent>
                <xs:extension base="xs:string">
                    <xs:attribute name="heading"
type="xs:string" use="optional" default="M&S Capabilities"/>
                </xs:extension>
            </xs:simpleContent>
        </xs:complexType>
    </xs:element>
    <xs:element name="MSLimitations">
        <xs:annotation>
            <xs:documentation><![CDATA[Describes the known
constraints and limitations under which the M&S will be developed, tested, and used, including constraints
on M&S development that result in limitations in M&S capabilities, as well as constraints on M&S testing
and evaluation that result in inadequate information regarding M&S capability (e.g., inadequate resource,
inadequate subject matter and technical knowledge expertise, unavailable data, inadequately defined M&S
requirements and methodologies, and inadequate test environments).]]></xs:documentation>
        </xs:annotation>
        <xs:complexType>
            <xs:simpleContent>
                <xs:extension base="xs:string">
                    <xs:attribute name="heading"
type="xs:string" use="optional" default="M&S Limitations"/>
                </xs:extension>
            </xs:simpleContent>
        </xs:complexType>
    </xs:element>
    <xs:element name="MSRisksImpacts">
        <xs:annotation>
            <xs:documentation><![CDATA[Describes the risks associated
with developing and/or using the M&S for the intended use including the risks resulting from identified
constraints and limitations and the risks associated with doing and/or not doing various VV&A tasks as
well as the impacts associated with those tasks.]]></xs:documentation>
        </xs:annotation>
        <xs:complexType>
            <xs:simpleContent>
                <xs:extension base="xs:string">
                    <xs:attribute name="heading"
type="xs:string" use="optional" default="M&S Risks/Impacts"/>
                </xs:extension>
            </xs:simpleContent>
        </xs:complexType>
    </xs:element>
</xs:sequence>
<xs:attribute name="heading" type="xs:string" use="optional" default="M&S
ASSUMPTIONS, CAPABILITIES, LIMITATIONS, & RISKS/IMPACTS"/>
</xs:complexType>
<xs:complexType name="MSDataType">

```

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<xs:sequence>
  <xs:element name="TextEntry" type="TextEntryType"/>
  <xs:element name="InputData">
    <xs:annotation>
      <xs:documentation><![CDATA[Identifies the data required to
populate and execute the M&S, including input data sets, hard-wired data (constants), environmental data,
and operational data. Descriptive metadata, metrics, and authoritative or approved sources are provided for
each.]]></xs:documentation>
    </xs:annotation>
    <xs:complexType>
      <xs:simpleContent>
        <xs:extension base="xs:string">
          <xs:attribute name="heading"
type="xs:string" use="optional" default="Input Data"/>
        </xs:extension>
      </xs:simpleContent>
    </xs:complexType>
  </xs:element>
  <xs:element name="OutputData">
    <xs:annotation>
      <xs:documentation><![CDATA[Identifies the M&S output
data, including a definition, the unit of measure, and the range of values for each data
item.]]></xs:documentation>
    </xs:annotation>
    <xs:complexType>
      <xs:simpleContent>
        <xs:extension base="xs:string">
          <xs:attribute name="heading"
type="xs:string" use="optional" default="Output Data"/>
        </xs:extension>
      </xs:simpleContent>
    </xs:complexType>
  </xs:element>
</xs:sequence>
<xs:attribute name="heading" type="xs:string" use="optional" default="Data"/>
</xs:complexType>
<xs:complexType name="MSDescriptionType">
  <xs:annotation>
    <xs:documentation><![CDATA[Contains pertinent detailed information about
the M&S being assessed. NOTE: possibly use a direct reference to MSC DMS schema
construct(s).]]></xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="TextEntry" type="TextEntryType"/>
    <xs:element name="MSOverview">
      <xs:annotation>
        <xs:documentation><![CDATA[Provides a description of the
M&S including the type of model (e.g., stochastic, deterministic, high resolution, low resolution, human in
the loop [HITL], hardware in the loop [HWIL], stand-alone, engineering, aggregated), and what types of
problems it is intended to support (e.g., training, force structure analysis, command and control,
experimentation, system analysis, analysis of alternatives).]]></xs:documentation>
      </xs:annotation>
      <xs:complexType>
        <xs:simpleContent>
          <xs:extension base="xs:string">

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                                <xs:attribute name="heading"
type="xs:string" use="optional" default="M&S Overview"/>
                                </xs:extension>
                                </xs:simpleContent>
                                </xs:complexType>
                                </xs:element>
                                <xs:element name="MSDevelopmentAndStructure">
                                <xs:annotation>
                                <xs:documentation><![CDATA[Provides information about
how the M&S was or will be developed, including the M&S development plan identifying the development
paradigm (e.g., spiral development, model-test-model), and basic assumptions about its
execution.]]></xs:documentation>
                                </xs:annotation>
                                <xs:complexType>
                                <xs:simpleContent>
                                <xs:extension base="xs:string">
                                <xs:attribute name="heading"
type="xs:string" use="optional" default="M&S Development and Structure"/>
                                </xs:extension>
                                </xs:simpleContent>
                                </xs:complexType>
                                </xs:element>
                                <xs:element name="MSCapabilitiesAndLimitations">
                                <xs:annotation>
                                <xs:documentation><![CDATA[Summarizes the capabilities
and limitations of the M&S.]]></xs:documentation>
                                </xs:annotation>
                                <xs:complexType>
                                <xs:simpleContent>
                                <xs:extension base="xs:string">
                                <xs:attribute name="heading"
type="xs:string" use="optional" default="M&S Capabilities and Limitations"/>
                                </xs:extension>
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                                </xs:complexType>
                                </xs:element>
                                <xs:element name="MSUseHistory" type="MSUseHistoryType">
                                <xs:annotation>
                                <xs:documentation><![CDATA[Describes how and when the
model has been used in the past as well as references relevant historical use
documents.]]></xs:documentation>
                                </xs:annotation>
                                </xs:element>
                                <xs:element name="MSData" type="MSDataType">
                                <xs:annotation>
                                <xs:documentation><![CDATA[Describes data used to
initialize the M&S and data produced by the M&S]]></xs:documentation>
                                </xs:annotation>
                                </xs:element>
                                <xs:element name="ConfigurationManagement">
                                <xs:annotation>
                                <xs:documentation><![CDATA[Describes the M&S
configuration management program, lists the M&S artifacts and products that are under configuration
management, identifies documentation and reporting requirements that impact the VV&A effort, and
provides contact information.]]></xs:documentation>

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        </xs:annotation>
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type="xs:string" use="optional" default="Configuration Management"/>
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            </xs:simpleContent>
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    </xs:element>
</xs:sequence>
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DESCRIPTION"/>
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<xs:complexType name="MSRequirementsAcceptabilityType">
    <xs:annotation>
        <xs:documentation><![CDATA[Data structure for describing the M&S
requirements defined for the intended use, the derived acceptability criteria that must be met to satisfy the
requirements, the quantitative and qualitative metrics used to measure their success, and the order of their
priority.]]></xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="TextEntry" type="TextEntryType"/>
        <xs:element name="MSRequirements" type="MSRequirementsType"
minOccurs="0"/>
    </xs:sequence>
    <xs:attribute name="heading" type="xs:string" use="optional" default="M&S
REQUIREMENTS AND ACCEPTABILITY CRITERIA"/>
</xs:complexType>
<xs:complexType name="MSRequirementsTraceabilityType">
    <xs:annotation>
        <xs:documentation><![CDATA[Establishes the links between the M&S
requirements, the acceptability criteria, and the evidence collected during the V&V processes. The
traceability matrix provides a visual representation of the chain of information that evolves as the VV&A
processes are implemented. As implementation progresses from the planning to reporting phases, the
traceability matrix assists in the identification of information gaps that may result from VV&A activities
not performed, not addressed, or not funded.]]></xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="TextEntry" type="TextEntryType"/>
        <xs:element name="MSRequirements" type="MSRequirementsType"
minOccurs="0"/>
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REQUIREMENTS TRACEABILITY MATRIX"/>
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maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="MSRequirementType">
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        <xs:annotation>
            <xs:documentation>Priority assigned to the
requirement.</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="RequirementNumber" type="xs:string">
        <xs:annotation>
            <xs:documentation>Number or identifier assigned to the
requirement.</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="Requirement" type="xs:string" minOccurs="0">
        <xs:annotation>
            <xs:documentation>Optional statement of the
requirement.</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="MSAcceptabilityCriteria"
type="MSAcceptabilityCriteriaType">
        <xs:annotation>
            <xs:documentation>Acceptability criteria (one or more)
assigned to the requirement.</xs:documentation>
        </xs:annotation>
    </xs:element>
</xs:sequence>
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<xs:complexType name="MSUseHistoryType">
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            <xs:attribute name="heading" type="xs:string" use="optional"
default="M&S Use History"/>
        </xs:extension>
    </xs:simpleContent>
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maxOccurs="unbounded"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="ParticipantType">
    <xs:sequence>
        <xs:element name="ParticipantName" type="xs:string"/>
        <xs:element name="ContactInformation" type="ContactInformationType"/>
        <xs:element name="RolePosition" type="xs:string"/>
        <xs:element name="KeyResponsibilities" type="xs:string"/>
        <xs:element name="SMEQualifications" type="xs:string"/>
    </xs:sequence>
</xs:complexType>
<xs:complexType name="ParticipantsType">
    <xs:annotation>
        <xs:documentation><![CDATA[Identifies the participants involved in the
VV&A effort as well as the roles that they are assigned and their key responsibilities within that role. Roles
and key responsibilities are defined during initial planning; names and contact information of the actual

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participants are added when they are determined. For each person serving as a Subject Matter Expert (SME), include a listing of the person's qualifications.]]</xs:documentation>

```

</xs:annotation>
<xs:sequence>
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  <xs:element name="Participants" type="ParticipantListType" minOccurs="0"/>
</xs:sequence>
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<xs:complexType name="POCsType">
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VV&A project or document.]]></xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="POC" type="POCType" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="PriorDocumentAppendixType">
  <xs:annotation>
    <xs:documentation><![CDATA[Structure for appendixes referencing prior
VV&A documents (App I in V&V Plan references the Accreditation Plan; App I in the V&V Report
references the V&V Plan; App I of the Accreditation Report references the Accreditation Plan; App J of the
Accreditation Report references the V&V Report). Allows entry of text.]]></xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="TextEntry" type="TextEntryType"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="ProblemStatementType">
  <xs:group ref="GeneralProblemStatementElements"/>
  <xs:attribute name="heading" type="xs:string" use="optional" default="PROBLEM
STATEMENT"/>
</xs:complexType>
<xs:complexType name="ProgrammaticsType">
  <xs:annotation>
    <xs:documentation><![CDATA[Contains detailed information regarding
resource allocation and funding that can be used to track VV&A expenditures (e.g., Activity, Required
Resources, Funding Source, Funds by Fiscal Year and Quarter).]]></xs:documentation>
  </xs:annotation>
</xs:complexType>
<xs:complexType name="RecommendationsType">
  <xs:annotation>
    <xs:documentation><![CDATA[Accreditation recommendations in the
Accreditation Report; V&V recommendations in the V&V Report.]]></xs:documentation>
  </xs:annotation>
  <xs:sequence>
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    <xs:element name="Recommendation" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="RecordOfChangeType">
  <xs:sequence>
    <xs:element name="Version">
      <xs:annotation>

```

```

        <xs:documentation>Document version affected by the
identified change.</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="Date">
        <xs:annotation>
            <xs:documentation>Date of this change to the identified
document version.</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="Changes">
        <xs:annotation>
            <xs:documentation>Description of the change or changes to
the document.</xs:documentation>
        </xs:annotation>
    </xs:element>
</xs:sequence>
</xs:complexType>
<xs:complexType name="RecordOfChangesType">
    <xs:annotation>
        <xs:documentation>Data structure for the history of changes made to the
document.</xs:documentation>
    </xs:annotation>
    <xs:sequence>
        <xs:element name="RecordOfChange" type="RecordOfChangeType"
minOccurs="0" maxOccurs="unbounded">
            <xs:annotation>
                <xs:documentation>Individual change record for the
document.</xs:documentation>
            </xs:annotation>
        </xs:element>
    </xs:sequence>
    <xs:attribute name="heading" type="xs:string" use="optional" default="RECORD OF
CHANGES"/>
</xs:complexType>
<xs:complexType name="ReferencesType">
    <xs:annotation>
        <xs:documentation><![CDATA[Identifies all of the references used in the
development of the document.]]></xs:documentation>
    </xs:annotation>
    <xs:simpleContent>
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            <xs:attribute name="heading" type="xs:string" use="optional"
default="REFERENCES"/>
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>
<xs:complexType name="ResultsValidationTestAnalysisItemType">
    <xs:sequence>
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        <xs:group ref="TestOutcomes"/>
        <xs:element name="ValidationTechnique" type="xs:string"/>
        <xs:group ref="TestAssessment"/>
    </xs:sequence>
</xs:complexType>

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    <xs:documentation>Description of results validation tests.</xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:group ref="TestDescription"/>
    <xs:group ref="TestSetup"/>
    <xs:element name="ValidationTechnique" type="xs:string">
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test.</xs:documentation>
      </xs:annotation>
    </xs:element>
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  <xs:sequence>
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    <xs:element name="ContactInfo" type="xs:string"/>
    <xs:element name="Agency" type="xs:string"/>
    <xs:element name="RelevantExperience" type="xs:string"/>
    <xs:element name="EducationCredentials" type="xs:string"/>
    <xs:element name="RelevantPublications" type="xs:string"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="VVProblemStatementType">
  <xs:sequence>
    <xs:group ref="GeneralProblemStatementElements"/>
    <xs:element name="VVScope" type="VVScopeType"/>
  </xs:sequence>
</xs:complexType>
<xs:complexType name="VVScopeType">
  <xs:annotation>
    <xs:documentation><![CDATA[Describes the scope of the verification and
validation activities. Common to V&V Plan and V&V Report templates.]]></xs:documentation>
  </xs:annotation>
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute name="heading" type="xs:string" use="optional"
default="V&amp;V Scope"/>
    </xs:extension>
  </xs:simpleContent>
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<xs:complexType name="VVTaskActivityType">
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    <xs:element name="VVTaskAnalyses" type="VVTaskAnalysisListType"
minOccurs="0"/>
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maxOccurs="unbounded"/>
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    </xs:complexType>
    <xs:complexType name="VVTaskAnalysisType">
        <xs:sequence>
            <xs:element name="VVTaskAnalysisNumber"/>
            <xs:element name="VVTaskAnalysisDescription" minOccurs="0"/>
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type="AccreditationAssessmentsType" minOccurs="0"/>
        </xs:sequence>
    </xs:complexType>
    <!-- ***** -->
    <!-- ***** Element Groups ***** -->
    <!-- ***** -->
    <xs:group name="GeneralProblemStatementElements">
        <xs:annotation>
            <xs:documentation/>
        </xs:annotation>
        <xs:sequence>
            <xs:element name="TextEntry" type="TextEntryType"/>
            <xs:element name="IntendedUse" type="IntendedUseType">
                <xs:annotation>
                    <xs:documentation><![CDATA[Describes the problem to be
addressed by the M&S, including the system or process being represented and the role it plays in the
overall program.]]></xs:documentation>
                </xs:annotation>
            </xs:element>
            <xs:element name="MSOverview">
                <xs:annotation>
                    <xs:documentation><![CDATA[Provides an overview of the
M&S for which this document is written and discusses the level of configuration control that currently
exists for the M&S.]]></xs:documentation>
                </xs:annotation>
            </xs:complexType>
            <xs:simpleContent>
                <xs:extension base="xs:string">
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type="xs:string" use="optional" default="M&S Overview"/>
                </xs:extension>
            </xs:simpleContent>
        </xs:complexType>
    </xs:element>
    <xs:element name="MSApplication">
        <xs:annotation>
            <xs:documentation><![CDATA[Describes how the M&S will
be used in the overall program and lists the program objectives the M&S must meet in order to fulfill the
intended use.]]></xs:documentation>
        </xs:annotation>
    </xs:complexType>

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        <xs:simpleContent>
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type="xs:string" use="optional" default="M&S Application"/>
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        </xs:simpleContent>
    </xs:complexType>
</xs:element>
<xs:element name="AccreditationScope">
    <xs:annotation>
        <xs:documentation><![CDATA[Describes the scope of the
accreditation effort based on the assessment of the risk of using the M&S and the availability of
resources>>.</xs:documentation>
    </xs:annotation>
    <xs:complexType>
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type="xs:string" use="optional" default="Accreditation Scope"/>
            </xs:extension>
        </xs:simpleContent>
    </xs:complexType>
</xs:element>
</xs:sequence>
</xs:group>
<xs:group name="TestAssessment">
    <xs:sequence>
        <xs:element name="CorrelateExpectedResults" type="xs:string"/>
        <xs:element name="AmplifyingInformation" type="xs:string"/>
        <xs:element name="TesterAssessment" type="xs:string"/>
        <xs:element name="ComparisonToAcceptabilityCriteria" type="xs:string"/>
    </xs:sequence>
</xs:group>
<xs:group name="TestDescription">
    <xs:sequence>
        <xs:element name="TestID" type="xs:string">
            <xs:annotation>
                <xs:documentation>Name or identification number of the
test.</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="TestName" type="xs:string">
            <xs:annotation>
                <xs:documentation>For test identification, provide the name
of the test.</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="TestDate" type="xs:string">
            <xs:annotation>
                <xs:documentation>For test identification, provide the date of
the test.</xs:documentation>
            </xs:annotation>
        </xs:element>
        <xs:element name="TestTime" type="xs:string">
            <xs:annotation>

```

```

the test.</xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:element name="TesterName" type="xs:string">
    <xs:annotation>
      <xs:documentation>Provide the tester's
name.</xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:element name="TesterOrganization" type="xs:string">
    <xs:annotation>
      <xs:documentation>Provide the tester's
organization.</xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:element name="TesterPhone" type="xs:string">
    <xs:annotation>
      <xs:documentation>Provide the tester's phone
number.</xs:documentation>
    </xs:annotation>
  </xs:element>
  <xs:element name="TesterEmail" type="xs:string">
    <xs:annotation>
      <xs:documentation>Provide the tester's
email.</xs:documentation>
    </xs:annotation>
  </xs:element>
</xs:sequence>
</xs:group>
<xs:group name="TestOutcomes">
  <xs:sequence>
    <xs:element name="TestResults" type="xs:string"/>
    <xs:element name="TestAnomalies" type="xs:string"/>
    <xs:element name="TestDiscrepancies" type="xs:string"/>
  </xs:sequence>
</xs:group>
<xs:group name="TestSetup">
  <xs:sequence>
    <xs:element name="TestArchitecture" type="xs:string">
      <xs:annotation>
        <xs:documentation>Describe the hardware/software
architecture.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="TestPurpose" type="xs:string">
      <xs:annotation>
        <xs:documentation>State purpose relative to the acceptability
criteria.</xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="CriterionNumber" type="xs:string">
      <xs:annotation>
        <xs:documentation>Reference to the acceptability criterion
related to this test.</xs:documentation>
      </xs:annotation>
    </xs:element>
  </xs:sequence>
</xs:group>

```

```

        </xs:annotation>
    </xs:element>
    <xs:element name="TestDescription" type="xs:string">
        <xs:annotation>
            <xs:documentation>Provide a brief description of the
test.</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="TestConditions" type="xs:string">
        <xs:annotation>
            <xs:documentation>Identify any prerequisite conditions that
must be established prior to performing the test case.</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="TestInputs" type="xs:string">
        <xs:annotation>
            <xs:documentation>Describe test inputs necessary for the test
case.</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="ExpectedResults" type="xs:string">
        <xs:annotation>
            <xs:documentation>Identify all expected results for the test
case.</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="TestProcedure" type="xs:string">
        <xs:annotation>
            <xs:documentation>Define the test procedure for the test
case.</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="TestAssumptions" type="xs:string">
        <xs:annotation>
            <xs:documentation>Identify any assumptions made in the
description of the test case.</xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="TestConstraints" type="xs:string">
        <xs:annotation>
            <xs:documentation>Identify any constraints imposed in the
description of the test case.</xs:documentation>
        </xs:annotation>
    </xs:element>
</xs:sequence>
</xs:group>
<!-- ***** -->
<!-- ***** Simple Types ***** -->
<!-- ***** -->
<xs:simpleType name="ClassificationType">
    <xs:annotation>
        <xs:documentation>Classification of a project or
document.</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">

```

```

        <xs:minLength value="1"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="DateType">
    <xs:annotation>
        <xs:documentation>Date of project initiation.</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
        <xs:minLength value="1"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="DocumentReferenceIDType">
    <xs:annotation>
        <xs:documentation><![CDATA[DVDT-assigned identifier for a VV&A
document.]]></xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string"/>
</xs:simpleType>
<xs:simpleType name="DocumentType">
    <xs:annotation>
        <xs:documentation>Enumeration list for the types of documents that can be
developed using the DVDT.</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
        <xs:enumeration value="Accreditation Plan"/>
        <xs:enumeration value="V&V Plan"/>
        <xs:enumeration value="V&V Report"/>
        <xs:enumeration value="Accreditation Report"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="POCType">
    <xs:annotation>
        <xs:documentation>Contact information on a participant, author, sponsor,
etc.</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
        <xs:minLength value="1"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="ProjectReferenceIDType">
    <xs:annotation>
        <xs:documentation><![CDATA[DVDT-assigned identifier for a VV&A
documentation project.]]></xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
        <xs:minLength value="1"/>
    </xs:restriction>
</xs:simpleType>
<xs:simpleType name="RequirementPriorityType">
    <xs:annotation>
        <xs:documentation>Priority value that can be assigned to a
requirement.</xs:documentation>
    </xs:annotation>
    <xs:restriction base="xs:string">
        <xs:minLength value="1"/>

```

```

        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="TaskNameType">
        <xs:restriction base="xs:string">
            <xs:minLength value="1"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="TextEntryType">
        <xs:restriction base="xs:string">
            <xs:minLength value="0"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="TitleType">
        <xs:annotation>
            <xs:documentation>Title of the document; name of a
resource.</xs:documentation>
        </xs:annotation>
        <xs:restriction base="xs:string">
            <xs:minLength value="0"/>
        </xs:restriction>
    </xs:simpleType>
</xs:schema>

```

APPENDIX B. STANDARDIZED VV&A DOCUMENTS XML SCHEMAS

B.1 Accreditation Plan XML Schema

```
<?xml version="1.0" encoding="UTF-8"?>
<!-- edited with XMLSpy v2008 (http://www.altova.com) by Curtis Blais (Naval Postgraduate School) -->
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns="http://metadata.dod.mil/mdr/ns/VVADocumentation/1.0"
targetNamespace="http://metadata.dod.mil/mdr/ns/VVADocumentation/1.0"
elementFormDefault="qualified" attributeFormDefault="unqualified" version="0.40">
  <xs:annotation>
    <xs:documentation><![CDATA[
      This XML Schema file describes standard content for an Accreditation Plan in
      accordance with reference [1]. Where applicable, complex and simple data types from schemas for DoD
      discovery metadata [2] and M&S Community of Interest discovery metadata [3] are referenced.
      [1] Department of Defense Standard Practice: Documentation of Verification, Validation
      and Accreditation (VV&A) for Models and Simulations, MIL-STD-3022, 28 January 2008. This standard
      establishes templates for the four core products of the M&S VV&A processes. The templates provide a
      common framework and interfacing capability between the four documents and support consistency and
      efficiency.
      [2] Department of Defense: Department of Defense Discovery Metadata Specification
      (DDMS), Version 1.4.1, dated 10 August 2007.
      [3] Modeling & Simulation Coordination Office: Modeling & Simulation Community of
      Interest Discovery Metadata Specification, document version 1.0.1 dated 1/22/2008 and schemas version
      1.0.2 dated 4/29/2008 and 5/21/2008.
    ]]></xs:documentation>
    <xs:documentation><![CDATA[
      Change Log:
      Author                                     Date
      Change
    ]]></xs:documentation>
  </xs:annotation>
  <!-- Include the VVA Documentation Base Types schema -->
  <xs:include schemaLocation="VVADocumentationBaseTypesV0.40.xsd"/>
  <!-- Define Accreditation Plan Content -->
  <xs:element name="AccreditationPlan">
    <xs:annotation>
      <xs:documentation>Standard content of an Accreditation Plan. The
      Accreditation Plan defines the criteria to be used during the accreditation assessment; defines the
      methodology to conduct the accreditation assessment; defines the resources needed to perform the
      accreditation assessment; and identifies issues associated with performing the accreditation
      assessment.</xs:documentation>
    </xs:annotation>
    <xs:complexType>
      <xs:sequence>
        <xs:element name="ProjectReferenceID"
type="ProjectReferenceIDType">
          <xs:annotation>
            <xs:documentation>Reference to the project
            identifier automatically entered in the document file by the DVDT software. This reference does not appear
            in the content of the VV&A document.</xs:documentation>
          </xs:annotation>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

```

        </xs:annotation>
      </xs:element>
      <xs:element name="DocumentReferenceID"
type="DocumentReferenceIDType">
        <xs:annotation>
          <xs:documentation>Document identifier
automatically assigned to this document by the DVDT software. This identifier does not appear in the
content of the VV&A document.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="AccreditationPlanTitlePage"
type="DocumentTitlePageType">
        <xs:annotation>
          <xs:documentation>Title page information for the
document.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="RecordOfChanges"
type="RecordOfChangesType">
        <xs:annotation>
          <xs:documentation>Record of changes made to
versions of the document.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="ExecutiveSummary">
        <xs:annotation>
          <xs:documentation><![CDATA[Provides an
overview of the Accreditation Plan. It should be a synopsis of the major elements from all sections of the
document, with emphasis on accreditation scope, M&S requirements, acceptability criteria, accreditation
methodology, and accreditation issues.]]></xs:documentation>
        </xs:annotation>
      <xs:complexType>
        <xs:simpleContent>
          <xs:extension base="xs:string">
            <xs:attribute name="heading"
type="xs:string" use="optional" default="ACCREDITATION PLAN EXECUTIVE SUMMARY"/>
          </xs:extension>
        </xs:simpleContent>
      </xs:complexType>
    </xs:element>
    <xs:element name="ProblemStatement"
type="ProblemStatementType">
      <xs:annotation>
        <xs:documentation><![CDATA[Describes the
problem the M&S is expected to address. The problem statement serves as the foundation for the definition
of requirements, acceptability criteria, and ultimately the accreditation assessment by documenting (1) the
question(s) to be answered and/or the particular aspects of the problem that the M&S will be used to help
address; (2) the decisions that will be made based on the M&S results; (3) the consequences resulting from
erroneous M&S outputs.]]></xs:documentation>
      </xs:annotation>
    </xs:element>
    <xs:element name="MSRequirementsAcceptability"
type="MSRequirementsAcceptabilityType">
      <xs:annotation>

```

<xs:documentation><![CDATA[Describes the M&S requirements defined for the intended use, the derived acceptability criteria that must be met to satisfy the requirements, the quantitative and qualitative metrics used to measure their success, and the order of their priority. The document section contains text and an optional table of requirements information.]]></xs:documentation>

</xs:annotation>
</xs:element>
<xs:element
name="MSAssumptionsCapabilitiesLimitationsRisksImpacts" type="MSCharacterizationType">
<xs:annotation>
<xs:documentation><![CDATA[Describes factors that constrain the development and/or use of the M&S or that impede the VV&A effort, including the assumptions, capabilities, limitations, and risk factors affecting M&S development and risks associated with using the M&S for the intended use.]]></xs:documentation>

</xs:annotation>
</xs:element>
<xs:element name="AccreditationMethodology">
<xs:annotation>
<xs:documentation><![CDATA[Describes the methods to be used in the accreditation assessment.]]></xs:documentation>

</xs:annotation>
<xs:complexType>
<xs:sequence>
<xs:element name="TextEntry"
type="TextEntryType"/>
<xs:element name="InformationNeeds"
type="InformationNeedsType">

<xs:annotation>
<xs:documentation><![CDATA[Describes the information needed to conduct the accreditation assessment; e.g., the information expected from the V&V effort, information expected from the development testing effort, information from the M&S developers, and information from the application. The document section contains text and an optional table of information needs.]]></xs:documentation>

</xs:annotation>
</xs:element>
<xs:element
name="InformationCollectionPlan" type="InformationCollectionPlanType">
<xs:annotation>

<xs:documentation><![CDATA[Describes how, when, and from whom the information is to be obtained, the form in which the information is to be provided, and the priority of each item. The document section contains text and an optional table describing elements of the information collection plan.]]></xs:documentation>

</xs:annotation>
</xs:element>
<xs:element name="AssessmentPlan"
type="AssessmentPlanType">
<xs:annotation>

<xs:documentation><![CDATA[Describes the assessment events, including the assessment techniques to be used and the specific roles and responsibilities of the participants, the milestones to be achieved, and the products to be produced.]]></xs:documentation>

</xs:annotation>
</xs:element>
</xs:sequence>

```

        <xs:attribute name="heading" type="xs:string"
use="optional" default="ACCREDITATION METHODOLOGY"/>
    </xs:complexType>
</xs:element>
<xs:element name="AccreditationIssues">
    <xs:annotation>
        <xs:documentation><![CDATA[Describes issues
associated with the accreditation effort that may arise due to resourcing, scheduling, development, or data
problems. Identifies the issue, the likelihood of its occurrence, contingency plans for addressing it, and the
probability of success.]]></xs:documentation>
    </xs:annotation>
    <xs:complexType>
        <xs:simpleContent>
            <xs:extension base="xs:string">
                <xs:attribute name="heading"
type="xs:string" use="optional" default="ACCREDITATION ISSUES"/>
            </xs:extension>
        </xs:simpleContent>
    </xs:complexType>
</xs:element>
<xs:element name="KeyParticipants">
    <xs:annotation>
        <xs:documentation><![CDATA[Identifies the
participants involved in the VV&A effort as well as the roles that they are assigned and their key
responsibilities within that role. Roles and key responsibilities are defined during initial planning; names
and contact information of the actual participants are added when they are determined. For each person
serving as a Subject Matter Expert (SME), include a listing of the person's
qualifications.]]></xs:documentation>
    </xs:annotation>
    <xs:complexType>
        <xs:sequence>
            <xs:element name="TextEntry"
type="TextEntryType"/>
            <xs:element
name="AccreditationParticipants">
                <xs:annotation>
                    <xs:documentation><![CDATA[Identifies the participants involved in the accreditation effort,
including their contact information, assigned role, and the key responsibilities associated with that role.
Typical accreditation roles include Accreditation Authority, Accreditation Agent, Accreditation Team, and
Subject Matter Experts (SMEs).]]></xs:documentation>
                </xs:annotation>
                <xs:complexType>
                    <xs:complexContent>
                        <xs:extension
base="ParticipantsType">
                            <xs:attribute name="heading" type="xs:string" use="optional" default="Accreditation
Participants"/>
                        </xs:extension>
                    </xs:complexContent>
                </xs:complexType>
            </xs:element>
            <xs:element name="VVParticipants">
                <xs:annotation>

```

<xs:documentation><![CDATA[Lists the participants involved in the V&V effort, including their contact information, assigned role, and the key responsibilities associated with that role. Typical V&V roles include M&S Proponent, V&V Agent, V&V Team, Validation Authority, Data Source, and SMEs.]]></xs:documentation>

```

</xs:annotation>
<xs:complexType>
  <xs:complexContent>
    <xs:extension
base="ParticipantsType">
  <xs:attribute name="heading" type="xs:string" use="optional" default="V&V Participants"/>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
</xs:element>
<xs:element name="OtherParticipants">
  <xs:annotation>

```

<xs:documentation><![CDATA[Identifies the members of the application program and model development effort with V&V or accreditation responsibilities as well as others who have a role in the VV&A process. The information should include their position or role, contact information, and VV&A responsibilities. Typical roles include M&S Program Manager, M&S Application Sponsor, M&S User, M&S Developer, Data Source, Milestone Decision Authority, Program Office, M&S Development Team, User Group, Configuration Control Board, and SMEs.]]></xs:documentation>

```

</xs:annotation>
<xs:complexType>
  <xs:complexContent>
    <xs:extension
base="ParticipantsType">
  <xs:attribute name="heading" type="xs:string" use="optional" default="Other Participants"/>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="heading" type="xs:string"
use="optional" default="KEY PARTICIPANTS"/>
  </xs:complexType>
</xs:element>
<xs:element name="PlannedAccreditationResources">
  <xs:annotation>

```

<xs:documentation><![CDATA[Identifies the resources needed to accomplish the accreditation. The information provided here should include the name of the activity, task, or event, the list of required resources (e.g., SMEs, equipment, TDY funding) needed to accomplish it, milestones, deadlines, and the POC. The activities, tasks, and events, and their associated milestones, products, and deadlines should be consistent with information provided elsewhere in this plan.]]></xs:documentation>

```

</xs:annotation>
<xs:complexType>
  <xs:sequence>
    <xs:element name="TextEntry"
type="TextEntryType"/>

```

```

name="AccreditationResourceRequirements">
    <xs:element
        <xs:annotation>
            <xs:documentation>Identifies the resources needed to accomplish the accreditation as planned.
            The information provided here should include the activity, task, or event; assigned performer; and the list
            of required resources (e.g., SMEs, equipment, and TDY funding).</xs:documentation>
        </xs:annotation>
        <xs:complexType>
            <xs:simpleContent>
                <xs:extension
                    base="xs:string">
                        <xs:attribute name="heading" type="xs:string" use="optional" default="Accreditation Resource
                        Requirements"/>
                    </xs:extension>
                </xs:simpleContent>
            </xs:complexType>
        </xs:element>
    </xs:element>
name="AccreditationMilestonesAndTimeline">
    <xs:annotation>
        <xs:documentation><![CDATA[Provides a chart of the overall program timeline with program,
        development, V&V, and accreditation milestones. The activities, tasks, and events, and their associated
        milestones, products, and deadlines should be consistent with information provided elsewhere in the
        plan.]]></xs:documentation>
    </xs:annotation>
    <xs:complexType>
        <xs:simpleContent>
            <xs:extension
                base="xs:string">
                    <xs:attribute name="heading" type="xs:string" use="optional" default="Accreditation Milestones
                    and Timeline"/>
                </xs:extension>
            </xs:simpleContent>
        </xs:complexType>
    </xs:element>
</xs:sequence>
<xs:attribute name="heading" type="xs:string"
use="optional" default="PLANNED ACCREDITATION RESOURCES"/>
</xs:complexType>
</xs:element>
<xs:element name="MSDescription" type="MSDescriptionType"/>
<!-- in conjunction with DDMS, look in MS COI DMS for description
of M&S resources-->
<xs:element name="MSRequirementsTraceability"
type="MSRequirementsTraceabilityType">
    <xs:annotation>
        <xs:documentation><![CDATA[Establishes the links
between the M&S requirements, the acceptability criteria, and the evidence collected during the V&V
processes. The traceability matrix provides a visual representation of the chain of information that evolves
as the VV&A processes are implemented. As implementation progresses from the planning to reporting
phases, the traceability matrix assists in the identification of information gaps that may result from VV&A

```

activities not performed, not addressed, or not funded. The document section contains text and an optional traceability table.]]></xs:documentation>

```

    </xs:annotation>
  </xs:element>
  <xs:element name="BasisOfComparison"
type="BasisOfComparisonType"/>
  <xs:element name="References" type="ReferencesType"/>
  <xs:element name="Acronyms" type="AcronymsType"/>
  <xs:element name="Glossary" type="GlossaryType"/>
  <xs:element name="AccreditationProgrammatics">
    <xs:complexType>
      <xs:complexContent>
        <xs:extension base="ProgrammaticsType">
          <xs:attribute name="heading"
type="xs:string" use="optional" default="ACCREDITATION PROGRAMMATICS"/>
        </xs:extension>
      </xs:complexContent>
    </xs:complexType>
  </xs:element>
  <xs:element name="DistributionList" type="DistributionListType"/>
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:schema>

```

B.2 V&V Plan XML Schema

```

<?xml version="1.0" encoding="UTF-8"?>
<!-- edited with XMLSpy v2008 rel. 2 sp1 (http://www.altova.com) by Curtis Blais (Naval Postgraduate School) -->
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns="http://metadata.dod.mil/mdr/ns/VVADocumentation/1.0"
targetNamespace="http://metadata.dod.mil/mdr/ns/VVADocumentation/1.0"
elementFormDefault="qualified" attributeFormDefault="unqualified" version="0.40">
  <xs:annotation>
    <xs:documentation><![CDATA[

```

This XML Schema file describes standard content for a Verification & Validation Plan in accordance with reference [1]. Where applicable, complex and simple data types from schemas for DoD discovery metadata [2] and M&S Community of Interest discovery metadata [3] are referenced.

[1] Department of Defense Standard Practice: Documentation of Verification, Validation and Accreditation (VV&A) for Models and Simulations, MIL-STD-3022, 28 January 2008. This standard establishes templates for the four core products of the M&S VV&A processes. The templates provide a common framework and interfacing capability between the four documents and support consistency and efficiency.

[2] Department of Defense: Department of Defense Discovery Metadata Specification (DDMS), Version 1.4.1, dated 10 August 2007.

[3] Modeling & Simulation Coordination Office: Modeling & Simulation Community of Interest Discovery Metadata Specification, document version 1.0.1 dated 1/22/2008 and schemas version 1.0.2 dated 4/29/2008 and 5/21/2008.

```

]]></xs:documentation>
<xs:documentation><![CDATA[

```

Change Log:	Date
Author	
Change(s)	

```

]]></xs:documentation>
</xs:annotation>
<!-- Include the VVA Documentation Base Types schema -->
<xs:include schemaLocation="VVADocumentationBaseTypesV0.40.xsd"/>
<!-- Define VV Plan Content -->
<xs:element name="VVPlan">
  <xs:annotation>
    <xs:documentation><![CDATA[Standard content of a Verification and
Validation Plan. The V&V Plan defines the methodology for scoping the V&V effort to the application and
the acceptability criteria; defines the V&V tasks that will produce information to support the accreditation
assessment; defines the resources needed to perform the V&V; and identifies issues associated with
performing the V&V.]]></xs:documentation>
  </xs:annotation>
  <xs:complexType>
    <xs:sequence>
      <xs:element name="ProjectReferenceID"
type="ProjectReferenceIDType">
        <xs:annotation>
          <xs:documentation>Reference to the project
identifier automatically entered in the document file by the DVDT software. This reference does not appear
in the content of the VV&A document.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="DocumentReferenceID"
type="DocumentReferenceIDType">
        <xs:annotation>
          <xs:documentation>Document identifier
automatically assigned to this document by the DVDT software. This identifier does not appear in the
content of the VV&A document.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="VVPlanTitlePage"
type="DocumentTitlePageType">
        <xs:annotation>
          <xs:documentation>Title page information for the
document.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="RecordOfChanges"
type="RecordOfChangesType">
        <xs:annotation>
          <xs:documentation>Record of changes made to
versions of the document.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="ExecutiveSummary">
        <xs:annotation>
          <xs:documentation><![CDATA[Provides an
overview of the V&V Plan. It should be a synopsis of the major elements from all sections of the
document, with emphasis on V&V scope, M&S requirements and acceptability criteria, V&V
methodology, and V&V issues.]]></xs:documentation>
        </xs:annotation>
      </xs:complexType>
      <xs:simpleContent>
        <xs:extension base="xs:string">

```

```

        <xs:attribute name="heading"
type="xs:string" use="optional" default="V&V PLAN EXECUTIVE SUMMARY"/>
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>
</xs:element>
<xs:element name="ProblemStatement"
type="VVProblemStatementType">
    <xs:annotation>
        <xs:documentation><![CDATA[Describes the
problem the M&S is expected to address. The problem statement serves as the foundation for the definition
of requirements, acceptability criteria, and ultimately the accreditation assessment by documenting (1) the
question(s) to be answered an/or the particular aspects of the problem that the M&S will be used to help
address; (2) the decisions that will be made based on the M&S results; (3) the consequences resulting from
erroneous M&S outputs.]]></xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="MSRequirementsAcceptability"
type="MSRequirementsAcceptabilityType">
    <xs:annotation>
        <xs:documentation><![CDATA[Describes the M&S
requirements defined for the intended use, the derived acceptability criteria that must be met to satisfy the
requirements, the quantitative and qualitative metrics used to measure their success, and the order of their
priority.]]></xs:documentation>
    </xs:annotation>
</xs:element>
</xs:element>
name="MSAssumptionsCapabilitiesLimitationsRisksImpacts" type="MSCharacterizationType">
    <xs:annotation>
        <xs:documentation><![CDATA[Describes factors
that constrain the development and/or use of the M&S or that impede the VV&A effort, including the
assumptions, capabilities, limitations, and risk factors affecting M&S development and risks associated
with using the M&S for the intended use.]]></xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="VVMethodology">
    <xs:annotation>
        <xs:documentation><![CDATA[Describes the step-
by-step road-mapping of how the V&V tasks should be performed. V&V tasks should be tailored according
to need, value added, and resources. Describes the planned V&V tasks, as well as each task's objectives,
assumptions, constraints, criteria, methodology, and how they should be measured and evaluated. Identifies
what performance metrics should be used.]]></xs:documentation>
    </xs:annotation>
</xs:complexType>
    <xs:sequence>
        <xs:element name="TextEntry"
type="TextEntryType"/>
    </xs:sequence>
</xs:element>
name="PlannedDataVVTasksActivities">
    <xs:annotation>
        <xs:documentation><![CDATA[Describes planned data V&V activities.]]></xs:documentation>
    </xs:annotation>
</xs:complexType>
</xs:sequence>

```

```

name="TextEntry" type="TextEntryType"/>
name="DataVerificationTasksActivities">
  <xs:annotation>
    <xs:documentation><![CDATA[Describes the overall approach for verifying the data within the
context of how it is used in the M&S.]]></xs:documentation>
  </xs:annotation>
  <xs:complexType>
    <xs:sequence>
      <xs:element name="TextEntry" type="TextEntryType"/>
      <xs:element name="DataVerificationTasksActivitiesList" minOccurs="0">
        <xs:annotation>
          <xs:documentation><![CDATA[Tasks/activities for verifying the data within
the context of how it is used in the M&S.]]></xs:documentation>
        </xs:annotation>
        <xs:complexType>
          <xs:sequence>
            <xs:element name="DataVerificationTaskActivity"
type="DataVerificationTaskActivityType" maxOccurs="unbounded"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
    <xs:attribute name="heading" type="xs:string" use="optional" default="Data Verification
Tasks/Activities"/>
  </xs:complexType>
name="DataValidationTasksActivities">
  <xs:annotation>
    <xs:documentation><![CDATA[Describes the overall approach for validating the data within the
context of how it is used in the M&S.]]></xs:documentation>

```

</xs:element

</xs:element

</xs:element>

</xs:element

```

</xs:annotation>

<xs:complexType>

<xs:sequence>

<xs:element name="TextEntry" type="TextEntryType"/>

<xs:element name="DataValidationTasksActivitiesList" minOccurs="0">

    <xs:annotation>

        <xs:documentation><![CDATA[Tasks/activities for verifying the data within
the context of how it is used in the M&S.]]></xs:documentation>

    </xs:annotation>

    <xs:complexType>

        <xs:sequence>

            <xs:element name="DataValidationTaskActivity"
type="DataValidationTaskActivityType" maxOccurs="unbounded"/>

        </xs:sequence>

    </xs:complexType>

</xs:element>

</xs:sequence>

<xs:attribute name="heading" type="xs:string" use="optional" default="Data Validation
Tasks/Activities"/>

</xs:complexType>

</xs:element>
name="RequiredValidationData">
</xs:element>
</xs:element>

<xs:annotation>

<xs:documentation><![CDATA[Describes/identifies the data that are needed to implement the
tasks. It also describes the coordination mechanism and schedule for obtaining the needed
data.]]></xs:documentation>

</xs:annotation>

<xs:complexType>

<xs:simpleContent>

<xs:extension base="xs:string">

```

```

        <xs:attribute name="heading" type="xs:string" use="optional" default="Required
Validation Data"/>

    </xs:extension>

    </xs:simpleContent>

    </xs:complexType>

    </xs:element>
    </xs:sequence>
    <xs:attribute
name="heading" type="xs:string" use="optional" default="Planned Data V&V Tasks/Activities"/>
    </xs:complexType>
    </xs:element>
    <xs:element
name="ConceptualModelActivities">
        <xs:annotation>

            <xs:documentation><![CDATA[Describes the overall approach for validating the conceptual
model. It should correlate specific segments of the conceptual model to the M&S requirements and
acceptability criteria as well as identify which authoritative resources will be used to establish the validity,
including subject matter experts (SMEs), reference documents, and reference data. For each, the following
information should be provided: (1) name and contact information; (2) agency; (3) summary of relevant
experience; (4) education credentials; (5) relevant publications.]]></xs:documentation>
        </xs:annotation>
    </xs:complexType>
    </xs:sequence>
    </xs:element>
name="TextEntry" type="TextEntryType"/>
    </xs:element>
name="ConceptualModelValidationTasksActivitiesList" minOccurs="0">
    <xs:annotation>

        <xs:documentation><![CDATA[Tasks/activities for validating the conceptual
model.]]></xs:documentation>

    </xs:annotation>

    <xs:complexType>

        <xs:sequence>

            <xs:element name="ConceptualModelValidationTaskActivity"
type="ConceptualModelValidationTaskActivityType" maxOccurs="unbounded"/>

        </xs:sequence>

    </xs:complexType>

    </xs:element>
    </xs:sequence>
    <xs:attribute
name="heading" type="xs:string" use="optional" default="Planned Conceptual Model Validation
Tasks/Activities"/>

```

```

        </xs:complexType>
    </xs:element>
</xs:element>
name="PlannedDesignVerificationTasksActivities">
    <xs:annotation>
        <xs:documentation><![CDATA[Describes the overall approach for verifying the M&S design. It
should correlate specific segments of the design to the conceptual model and to the acceptability criteria as
well as cite applicable standards, codes, best practices, etc., to which the design should adhere and how
adherence should be evaluated.]]></xs:documentation>
    </xs:annotation>
    <xs:complexType>
        <xs:sequence>
            <xs:element
name="TextEntry" type="TextEntryType"/>
            <xs:element
name="DesignVerificationTasksActivitiesList" minOccurs="0">
                <xs:annotation>
                    <xs:documentation><![CDATA[Tasks/activities for verifying the M&S
design.]]></xs:documentation>
                </xs:annotation>
                <xs:complexType>
                    <xs:sequence>
                        <xs:element name="DesignVerificationTaskActivity"
type="DesignVerificationTaskActivityType" maxOccurs="unbounded"/>
                    </xs:sequence>
                </xs:complexType>
            </xs:element>
        </xs:sequence>
    </xs:attribute>
name="heading" type="xs:string" use="optional" default="Planned Design Verification Tasks/Activities"/>
    </xs:complexType>
</xs:element>
</xs:element>
name="PlannedImplementationVerificationTasksActivities">
    <xs:annotation>
        <xs:documentation><![CDATA[Describes the overall approach for verifying the M&S
implementation. It should describe how the M&S development documentation (installation guide, user's
manual, and so on) should be reviewed and evaluated as well as state how completeness, correctness, and
consistency of functional requirements should be measured.]]></xs:documentation>
    </xs:annotation>
    <xs:complexType>
        <xs:sequence>
            <xs:element
name="TextEntry" type="TextEntryType"/>

```

```

name="SuiteOfTests">
    <xs:annotation>
        <xs:documentation><![CDATA[Provides discussion of the planned scenarios, test cases, and
sample size required, as well as a determination of the completeness of the test suite to support traceability
to the M&S requirements. Traceability to requirements and acceptability criteria are documented in
Appendix B M&S Requirements Traceability Matrix. Additionally, these tests are intended to verify that
the software code is error free and that there is successful integration of all components into a single
system, system of systems, or federation.]]></xs:documentation>
    </xs:annotation>
    <xs:complexType>
        <xs:simpleContent>
            <xs:extension base="xs:string">
                <xs:attribute name="heading" type="xs:string" use="optional" default="Define Suite of
Tests"/>
            </xs:extension>
        </xs:simpleContent>
    </xs:complexType>
</xs:element>
</xs:element>
name="ImplementationVerificationTestDescription">
    <xs:annotation>
        <xs:documentation><![CDATA[Discusses what organization will run the tests, what organization
will analyze the results, the time required to do so, and the schedule for accomplishing the
runs.]]></xs:documentation>
    </xs:annotation>
    <xs:complexType>
        <xs:sequence>
            <xs:element name="TextEntry" type="TextEntryType"/>
            <xs:element name="ImplementationVerificationTestList" minOccurs="0">
                <xs:annotation>
                    <xs:documentation><![CDATA[Descriptions of tests to be used for
implementation verification.]]></xs:documentation>
                </xs:annotation>
            </xs:element>
        </xs:sequence>
    </xs:complexType>
</xs:element>

```

```

<xs:complexType>
  <xs:sequence>
    <xs:element name="ImplementationVerificationTest"
type="ImplementationVerificationTestType" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="heading" type="xs:string" use="optional" default="Implementation
Verification Test Description"/>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute
name="heading" type="xs:string" use="optional" default="Planned Implementation Verification
Tasks/Activities"/>
</xs:complexType>
</xs:element>
</xs:element
name="PlannedResultsValidationTasksActivities">
  <xs:annotation>
    <xs:documentation><![CDATA[Describes the overall approach for validating the M&S results. It
should correlate M&S results with acceptability criteria and M&S requirements as well as identify all
authoritative resources to be used in evaluating the M&S results, including SMEs; mathematical or
statistical techniques; and data resources. It should state how the resources are to be applied and how the
results are to be evaluated. For SMEs, it should describe the specialized skills or knowledge that is
needed.]]></xs:documentation>
  </xs:annotation>
</xs:complexType>
<xs:sequence>
  <xs:element
name="TextEntry" type="TextEntryType"/>
  <xs:element
name="SuiteOfTests">
    <xs:annotation>
      <xs:documentation><![CDATA[Provides discussion of the planned scenarios, test cases, and
sample size required to assess the M&S results from the perspective of the intended use.Traceability to
requirements and acceptability criteria are documented in Appendix B M&S Requirements Traceability
Matrix.]]></xs:documentation>
    </xs:annotation>
  </xs:complexType>

```

```

    <xs:simpleContent>
      <xs:extension base="xs:string">
        <xs:attribute name="heading" type="xs:string" use="optional" default="Define Suite of
Tests"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element
name="ResultsValidationTestDescription">
  <xs:annotation>
    <xs:documentation><![CDATA[Describes the planned results validation tests, the organization
that will run the tests, the organization that will analyze the results, the time required to do so, and the
schedule for accomplishing the tests.]]></xs:documentation>
  </xs:annotation>
  <xs:complexType>
    <xs:sequence>
      <xs:element name="TextEntry" type="TextEntryType"/>
      <xs:element name="ResultsValidationTestList" minOccurs="0">
        <xs:annotation>
          <xs:documentation><![CDATA[Descriptions of tests to be used for results
validation.]]></xs:documentation>
        </xs:annotation>
        <xs:complexType>
          <xs:sequence>
            <xs:element name="ResultsValidationTest"
type="ResultsValidationTestType" maxOccurs="unbounded"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
  </xs:complexType>
</xs:element>
</xs:sequence>

```

```

        <xs:attribute name="heading" type="xs:string" use="optional" default="Results Validation Test
Description"/>
    </xs:complexType>
    </xs:element>
    </xs:sequence>
    <xs:attribute
name="heading" type="xs:string" use="optional" default="Planned Results Validation Tasks/Activities"/>
    </xs:complexType>
    </xs:element>
    <xs:element
name="PlannedVVRReportingActivities">
        <xs:annotation>
            <xs:documentation><![CDATA[Describes the plans for producing and delivering the V&V
Report and Accreditation Package.]]></xs:documentation>
        </xs:annotation>
        <xs:complexType>
            <xs:simpleContent>
                <xs:extension
base="xs:string">
                    <xs:attribute name="heading" type="xs:string" use="optional" default="Planned V&V
Reporting Tasks/Activities"/>
                </xs:extension>
            </xs:simpleContent>
        </xs:complexType>
    </xs:element>
    </xs:sequence>
    <xs:attribute name="heading" type="xs:string"
use="optional" default="V&V METHODOLOGY"/>
    </xs:complexType>
    </xs:element>
    <xs:element name="VVIssues">
        <xs:annotation>
            <xs:documentation><![CDATA[Describes important
unresolved issues relevant to this stage of the VV&A effort, including administration, coordination, and
execution. Report activities underway to address these issues and the probability of each activity's success.
As the V&V effort is both iterative and dependent on the products of the M&S development process, the
V&V processes should, most likely, uncover several unresolved issues throughout the VV&A effort.
Although these open-ended areas of concern are common, it is important to document all issues early on
and formulate what activities are being executed, or will be conducted, to address each issue, along with the
probability of their success.]]></xs:documentation>
        </xs:annotation>
        <xs:complexType>
            <xs:simpleContent>
                <xs:extension base="xs:string">
                    <xs:attribute name="heading"
type="xs:string" use="optional" default="V&V ISSUES"/>
                </xs:extension>
            </xs:simpleContent>
        </xs:complexType>
    </xs:element>
    <xs:element name="KeyParticipants">

```

<xs:annotation>
 <xs:documentation><![CDATA[Identifies the participants involved in the VV&A effort as well as the roles that they are assigned and their key responsibilities within that role. Roles and key responsibilities are defined during initial planning; names and contact information of the actual participants are added when they are determined. For each person serving as a Subject Matter Expert (SME), include a listing of the person's qualifications.]]></xs:documentation>

</xs:annotation>
 <xs:complexType>
 <xs:sequence>
 <xs:element name="TextEntry" type="TextEntryType"/>
 </xs:sequence>
 </xs:complexType>
 </xs:element>
 name="AccreditationParticipants">

<xs:annotation>
 <xs:documentation><![CDATA[Identifies the participants involved in the accreditation effort, including their contact information, assigned role, and the key responsibilities associated with that role. Typical accreditation roles include Accreditation Authority, Accreditation Agent, Accreditation Team, and Subject Matter Experts (SMEs).]]></xs:documentation>

</xs:annotation>
 <xs:complexType>
 <xs:complexContent>
 <xs:extension base="ParticipantsType">

<xs:attribute name="heading" type="xs:string" use="optional" default="Accreditation Participants"/>

</xs:extension>
 </xs:complexContent>
 </xs:complexType>
 </xs:element>
 <xs:element name="VVParticipants">
 <xs:annotation>

<xs:documentation><![CDATA[Lists the participants involved in the V&V effort, including their contact information, assigned role, and the key responsibilities associated with that role. Typical V&V roles include M&S Proponent, V&V Agent, V&V Team, Validation Authority, Data Source, and SMEs.]]></xs:documentation>

</xs:annotation>
 <xs:complexType>
 <xs:complexContent>
 <xs:extension base="ParticipantsType">

<xs:attribute name="heading" type="xs:string" use="optional" default="V&V Participants"/>

</xs:extension>
 </xs:complexContent>
 </xs:complexType>
 </xs:element>
 <xs:element name="OtherParticipants">
 <xs:annotation>

<xs:documentation><![CDATA[Identifies the members of the application program and model development effort with V&V or accreditation responsibilities as well as others who have a role in the

VV&A process. The information should include their position or role, contact information, and VV&A responsibilities. Typical roles include M&S Program Manager, M&S Application Sponsor, M&S User, M&S Developer, Data Source, Milestone Decision Authority, Program Office, M&S Development Team, User Group, Configuration Control Board, and SMEs.]]></xs:documentation>

```

</xs:annotation>
</xs:complexType>
</xs:complexContent>
</xs:extension>
base="ParticipantsType">
  <xs:attribute name="heading" type="xs:string" use="optional" default="Other Participants"/>
</xs:extension>
</xs:complexContent>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="heading" type="xs:string"
use="optional" default="KEY PARTICIPANTS"/>
</xs:complexType>
</xs:element>
<xs:element name="PlannedVVResources">
  <xs:annotation>
    <xs:documentation><![CDATA[Discusses the
resources required to implement this V&V plan, such as performers, man-hours, materials, and funding.
This information establishes a mechanism for tracking required resources, the availability of resources, and
the impact of resource availability on performing V&V activities and meeting
milestones.]]></xs:documentation>
  </xs:annotation>
</xs:complexType>
</xs:sequence>
<xs:element name="TextEntry"
type="TextEntryType"/>
</xs:element>
name="VVResourceRequirements">
  <xs:annotation>
    <xs:documentation><![CDATA[Identifies the resources needed to accomplish the V&V as
planned. The information should include the activity, task, or event; assigned performer; and the list of
required resources (e.g., SMEs, equipment, and TDY funding).]]></xs:documentation>
  </xs:annotation>
</xs:complexType>
</xs:simpleContent>
</xs:extension>
base="xs:string">
  <xs:attribute name="heading" type="xs:string" use="optional" default="V&V Resource
Requirements"/>
</xs:extension>
</xs:simpleContent>
</xs:complexType>
</xs:element>
</xs:element>
name="VVMilestoneAndTimeline">
  <xs:annotation>

```

<xs:documentation><![CDATA[Provides a chart of the overall program timeline with program, development, V&V and accreditation milestones. The activities, tasks, and events, and their associated milestones, products, and deadlines should be consistent with information provided elsewhere in this plan.]]></xs:documentation>

</xs:annotation>
 <xs:complexType>
 <xs:simpleContent>
 <xs:extension
 base="xs:string">

<xs:attribute name="heading" type="xs:string" use="optional" default="V&V Milestones and Timeline"/>

</xs:extension>
 </xs:simpleContent>
 </xs:complexType>
 </xs:element>

<xs:sequence>
 </xs:complexType>
 </xs:element>
 <xs:element name="MSDescription" type="MSDescriptionType">
 <xs:annotation>
 <xs:documentation><![CDATA[Provides pertinent
 detailed information about the M&S being assessed.]]></xs:documentation>
 </xs:annotation>
 <!-- in conjunction with DDMS, look in MS COI DMS for
 description of M&S resources-->

</xs:element>
 <xs:element name="MSRequirementsTraceability"
 type="MSRequirementsTraceabilityType">

<xs:annotation>
 <xs:documentation><![CDATA[Establishes the links
 between the M&S requirements, the acceptability criteria, and the evidence collected during the V&V
 processes. The traceability matrix provides a visual representation of the chain of information that evolves
 as the VV&A processes are implemented. As implementation progresses from the planning to reporting
 phases, the traceability matrix assists in the identification of information gaps that may result from VV&A
 activities not performed, not addressed, or not funded. The document section contains text and an optional
 traceability table.]]></xs:documentation>

</xs:annotation>
 </xs:element>
 <xs:element name="BasisOfComparison"
 type="BasisOfComparisonType"/>

<xs:element name="References" type="ReferencesType"/>
 <xs:element name="Acronyms" type="AcronymsType"/>
 <xs:element name="Glossary" type="GlossaryType"/>
 <xs:element name="VVProgrammatics">
 <xs:complexType>
 <xs:complexContent>
 <xs:extension base="ProgrammaticsType">
 <xs:attribute name="heading"

type="xs:string" use="optional" default="V&V PROGRAMMATICS"/>
 </xs:extension>
 </xs:complexContent>
 </xs:complexType>

</xs:element>

```

        <xs:element name="DistributionList" type="DistributionListType"/>
        <xs:element name="AccreditationPlanReference">
            <xs:annotation>
                <xs:documentation>Provides a copy of or a reference
to the Accreditation Plan for the simulation for which this document has been
prepared.</xs:documentation>
            </xs:annotation>
            <xs:complexType>
                <xs:complexContent>
                    <xs:extension
base="PriorDocumentAppendixType">
                        <xs:attribute name="heading"
type="xs:string" use="optional" default="ACCREDITATION PLAN"/>
                    </xs:extension>
                </xs:complexContent>
            </xs:complexType>
        </xs:element>
    </xs:sequence>
</xs:complexType>
</xs:element>
</xs:schema>

```

B.3 V&V Report XML Schema

```

<?xml version="1.0" encoding="UTF-8"?>
<!-- edited with XMLSpy v2008 (http://www.altova.com) by Curtis Blais (Naval Postgraduate School) -->
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns="http://metadata.dod.mil/mdr/ns/VVADocumentation/1.0"
targetNamespace="http://metadata.dod.mil/mdr/ns/VVADocumentation/1.0"
elementFormDefault="qualified" attributeFormDefault="unqualified" version="0.40">
    <xs:annotation>

```

<xs:documentation><![CDATA[
 This XML Schema file describes standard content for a Verification & Validation Report
 in accordance with reference [1]. Where applicable, complex and simple data types from schemas for DoD
 discovery metadata [2] and M&S Community of Interest discovery metadata [3] are referenced.

[1] Department of Defense Standard Practice: Documentation of Verification, Validation
 and Accreditation (VV&A) for Models and Simulations, MIL-STD-3022, 28 January 2008. This standard
 establishes templates for the four core products of the M&S VV&A processes. The templates provide a
 common framework and interfacing capability between the four documents and support consistency and
 efficiency.

[2] Department of Defense: Department of Defense Discovery Metadata Specification
 (DDMS), Version 1.4.1, dated 10 August 2007.

[3] Modeling & Simulation Coordination Office: Modeling & Simulation Community of
 Interest Discovery Metadata Specification, document version 1.0.1 dated 1/22/2008 and schemas version
 1.0.2 dated 4/29/2008 and 5/21/2008.

```

    ]></xs:documentation>
    <xs:documentation><![CDATA[

```

Change Log:

Author	Date	
Change		
Curtis Blais	2007-11-28	v0.10

General content structures for the V&V Report. Uses complex types defined in the VV&A document
 common elements schema.

Curtis Blais	2008-02-22	v0.11
Added version to the namespace URI.		
Curtis Blais	2008-05-29	v0.12
Revised against the 28 January 2008 MIL-STD-3022 [1].		
Curtis Blais	2008-06-26	v0.13
Revised to current base types schema; added Discussion to DataTaskAnalysisType, DataVerificationTaskListType, DataValidationTaskListType, TestingTaskAnalysisType.		
Curtis Blais	2008-08-25	v0.20
Major update to align with design agreements and DVDT GUI mock-ups.		
Curtis Blais	2008-08-24	v0.30
Release for DVDT development.		
Curtis Blais	2008-08-31	v0.4
Updated to v0.4 version of VVADocumentationBaseTypes schema; added structure to reference the prior Accreditation Plan.		

```

]]></xs:documentation>
</xs:annotation>
<!-- Include the VVA Documentation Base Types schema -->
<xs:include schemaLocation="VVADocumentationBaseTypesV0.40.xsd"/>
<!-- Define VV Report Content -->
<xs:element name="VVReport">
  <xs:annotation>
    <xs:documentation><![CDATA[Standard content of a Verification & Validation
Report. The V&V Report documents the results of the V&V tasks; documents M&S assumptions,
capabilities, limitations, risks, and impacts; identifies unresolved issues associated with V&V
implementation; and documents lessons learned during V&V.]]></xs:documentation>
  </xs:annotation>
  <xs:complexType>
    <xs:sequence>
      <xs:element name="ProjectReferenceID"
type="ProjectReferenceIDType">
        <xs:annotation>
          <xs:documentation>Reference to the project
identifier automatically entered in the document file by the DVDT software. This reference does not appear
in the content of the VV&A document.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="DocumentReferenceID"
type="DocumentReferenceIDType">
        <xs:annotation>
          <xs:documentation>Document identifier
automatically assigned to this document by the DVDT software. This identifier does not appear in the
content of the VV&A document.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="VVReportTitlePage"
type="DocumentTitlePageType">
        <xs:annotation>
          <xs:documentation>Title page information for the
document.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="RecordOfChanges"
type="RecordOfChangesType">
        <xs:annotation>

```

```

        <xs:documentation>Record of changes made to
versions of the document.</xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="ExecutiveSummary">
    <xs:annotation>
        <xs:documentation><![CDATA[Provides an
overview of the V&V Report. It should be a synopsis of the major elements from all sections of the
document, with emphasis on V&V scope, M&S requirements and acceptability criteria, V&V task analysis,
and V&V recommendations.]]></xs:documentation>
    </xs:annotation>
    <xs:complexType>
        <xs:simpleContent>
            <xs:extension base="xs:string">
                <xs:attribute name="heading"
type="xs:string" use="optional" default="V&V REPORT EXECUTIVE SUMMARY"/>
            </xs:extension>
        </xs:simpleContent>
    </xs:complexType>
</xs:element>
<xs:element name="ProblemStatement"
type="VVProblemStatementType">
    <xs:annotation>
        <xs:documentation><![CDATA[Describes the
problem the M&S is expected to address. The problem statement serves as the foundation for the definition
of requirements, acceptability criteria, and ultimately the accreditation assessment by documenting (1) the
question(s) to be answered an/or the particular aspects of the problem that the M&S will be used to help
address; (2) the decisions that will be made based on the M&S results; (3) the consequences resulting from
erroneous M&S outputs.]]></xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="MSRequirementsAcceptability"
type="MSRequirementsAcceptabilityType">
    <xs:annotation>
        <xs:documentation><![CDATA[Describes the M&S
requirements defined for the intended use, the derived acceptability criteria that must be met to satisfy the
requirements, the quantitative and qualitative metrics used to measure their success, and the order of their
priority.]]></xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element
name="MSAssumptionsCapabilitiesLimitationsRisksImpacts" type="MSCharacterizationType">
    <xs:annotation>
        <xs:documentation><![CDATA[Describes factors
that constrain the development and/or use of the M&S or that impede the VV&A effort, including the
assumptions, capabilities, limitations, and risk factors affecting M&S development and risks associated
with using the M&S for the intended use.]]></xs:documentation>
    </xs:annotation>
</xs:element>
<xs:element name="VVTaskAnalysis">
    <xs:annotation>
        <xs:documentation><![CDATA[Provides an
overview of the results of the V&V inspection and testing activities. Included are details regarding any
deviations from the V&V Plan and the justification for each change as well as all sources of data and any
applicable quality-assurance documentation.]]></xs:documentation>

```

```

        </xs:annotation>
        <xs:complexType>
            <xs:sequence>
                <xs:element name="TextEntry"
type="TextEntryType"/>
            <xs:element
name="DataVVTaskAnalysis">
                <xs:annotation>
                    <xs:documentation><![CDATA[Describes the analysis of the results of data verification and
validations tasks.]]></xs:documentation>
                </xs:annotation>
                <xs:complexType>
                    <xs:sequence>
                        <xs:element
name="TextEntry" type="TextEntryType"/>
                    <xs:element
name="DataVerificationTaskAnalysis">
                        <xs:annotation>
                            <xs:documentation><![CDATA[Describes the analysis of the results of each data verification
task.]]></xs:documentation>
                        </xs:annotation>
                        <xs:complexType>
                            <xs:sequence>
                                <xs:element name="TextEntry" type="TextEntryType"/>
                                <xs:element name="DataVerificationTaskAnalysisList" minOccurs="0">
                                    <xs:annotation>
                                        <xs:documentation><![CDATA[Describes the analysis of results of each data
verification task.]]></xs:documentation>
                                    </xs:annotation>
                                    <xs:complexType>
                                        <xs:sequence>
                                            <xs:element name="DataVerificationTaskAnalysisItem"
type="DataVerificationTaskAnalysisItemType" maxOccurs="unbounded"/>
                                        </xs:sequence>
                                    </xs:complexType>
                                </xs:element>
                            </xs:sequence>
                        </xs:complexType>
                    </xs:sequence>
                </xs:complexType>
            </xs:sequence>
        </xs:complexType>
    </xs:sequence>

```

```
<xs:attribute name="heading" type="xs:string" use="optional" default="Data Verification Task Analysis"/>
```

```
</xs:complexType>
</xs:element>
</xs:element>
name="DataValidationTaskAnalysis">
```

```
<xs:annotation>
<xs:documentation><![CDATA[Describes the analysis of results of each data validation task.]]></xs:documentation>
```

```
</xs:annotation>
<xs:complexType>
<xs:sequence>
<xs:element name="TextEntry" type="TextEntryType"/>
<xs:element name="DataValidationTaskAnalysisList" minOccurs="0">
```

```
<xs:annotation>
<xs:documentation><![CDATA[Describes the analysis of results of each data validation task.]]></xs:documentation>
```

```
</xs:annotation>
<xs:complexType>
<xs:sequence>
<xs:element name="DataValidationTaskAnalysisItem"
type="DataValidationTaskAnalysisItemType" maxOccurs="unbounded"/>
```

```
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:sequence>
```

```
<xs:attribute name="heading" type="xs:string" use="optional" default="Data Validation Task Analysis"/>
```

```
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute
name="heading" type="xs:string" use="optional" default="Data V&V Task Analysis"/>
</xs:complexType>
```

```

name="ConceptualModelTaskAnalysis">
    </xs:element>
    </xs:element>
    <xs:annotation>
        <xs:documentation><![CDATA[Describes the analysis of the results of each conceptual model
validation task]]></xs:documentation>
    </xs:annotation>
    <xs:complexType>
        <xs:sequence>
            <xs:element
name="TextEntry" type="TextEntryType"/>
            <xs:element
name="ConceptualModelValidationTaskAnalysisList" minOccurs="0">
                <xs:annotation>
                    <xs:documentation><![CDATA[Describes the results of each conceptual model validation
task.]]></xs:documentation>
                </xs:annotation>
                <xs:complexType>
                    <xs:sequence>
                        <xs:element name="ConceptualModelValidationTaskAnalysisItem"
type="ConceptualModelValidationTaskAnalysisItemType" maxOccurs="unbounded"/>
                    </xs:sequence>
                </xs:complexType>
            </xs:element>
        </xs:sequence>
        <xs:attribute
name="heading" type="xs:string" use="optional" default="Conceptual Model Validation Task Analysis"/>
    </xs:complexType>
</xs:element>
</xs:element>
name="DesignVerificationTaskAnalysis">
    <xs:annotation>
        <xs:documentation><![CDATA[Describes the analysis of the results of each design verification
task.]]></xs:documentation>
    </xs:annotation>
    <xs:complexType>
        <xs:sequence>
            <xs:element
name="TextEntry" type="TextEntryType"/>
            <xs:element
name="DesignVerificationTaskAnalysisList" minOccurs="0">
                <xs:annotation>

```

```

        <xs:documentation><![CDATA[Describes the analysis of the results of each design verification
task.]]></xs:documentation>

        </xs:annotation>

        <xs:complexType>

        <xs:sequence>

        <xs:element name="DesignVerificationTaskAnalysisItem"
type="DesignVerificationTaskAnalysisItemType" maxOccurs="unbounded"/>

        </xs:sequence>

        </xs:complexType>

        </xs:element>
        </xs:sequence>
        <xs:attribute
name="heading" type="xs:string" use="optional" default="Design Verification Task Analysis"/>
        </xs:complexType>
        </xs:element>
        <xs:element
name="ImplementationVerificationTaskAnalysis">
        <xs:annotation>

        <xs:documentation><![CDATA[Describes the analysis of the implementation verification test
results.]]></xs:documentation>

        </xs:annotation>
        <xs:complexType>
        <xs:sequence>
        <xs:element
name="TextEntry" type="TextEntryType"/>
        <xs:element
name="ImplementationVerificationTestList" minOccurs="0">
        <xs:annotation>

        <xs:documentation><![CDATA[Describes results of implementation verification task
analysis.]]></xs:documentation>

        </xs:annotation>

        <xs:complexType>

        <xs:sequence>

        <xs:element name="ImplementationVerificationTestAnalysisItem"
type="ImplementationVerificationTestAnalysisItemType" maxOccurs="unbounded"/>

        </xs:sequence>

        </xs:complexType>

        </xs:element>
</xs:sequence>

```

```

<xs:attribute
name="heading" type="xs:string" use="optional" default="Implementation Verification Task Analysis"/>
</xs:complexType>
</xs:element>
<xs:element
name="ResultsValidationTaskAnalysis">
<xs:annotation>
<xs:documentation><![CDATA[Describes the analysis of the validation test
results]]></xs:documentation>
</xs:annotation>
<xs:complexType>
<xs:sequence>
<xs:element
name="TextEntry" type="TextEntryType"/>
<xs:element
name="ResultsValidationTestList" minOccurs="0">
<xs:annotation>
<xs:documentation><![CDATA[Describes results of validation test
analysis.]]></xs:documentation>
</xs:annotation>
<xs:complexType>
<xs:sequence>
<xs:element name="ResultsValidationTestAnalysisItem"
type="ResultsValidationTestAnalysisItemType" maxOccurs="unbounded"/>
</xs:sequence>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute
name="heading" type="xs:string" use="optional" default="Results Validation Task Analysis"/>
</xs:complexType>
</xs:element>
<xs:element
name="ReportingTaskAnalysis">
<xs:annotation>
<xs:documentation><![CDATA[Describes how the V&V activities were documented and what
documentation was delivered.]]></xs:documentation>
</xs:annotation>
<xs:complexType>
<xs:simpleContent>
<xs:extension
base="xs:string">
<xs:attribute name="heading" type="xs:string" use="optional" default="V&V Reporting
Task Analysis"/>

```

```

</xs:extension>
</xs:simpleContent>
</xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="heading" type="xs:string"
use="optional" default="V&V TASK ANALYSIS"/>
</xs:complexType>
</xs:element>
<xs:element name="VVRecommendations">
<xs:annotation>
<xs:documentation><![CDATA[Discusses any
unresolved issues relevant to the V&V effort and reports activities undertaken to address these issues and
associated recommendations. Also describes the conclusions of the M&S fidelity as drawn from the V&V
processes and the articulation of any unresolved issues. These issues should be enumerated along with any
processes undertaken for their resolution, and recommendations relevant to M&S development, V&V
processes, accreditation, and/or M&S reuse.]]></xs:documentation>
</xs:annotation>
<xs:complexType>
<xs:simpleContent>
<xs:extension base="xs:string">
<xs:attribute name="heading"
type="xs:string" use="optional" default="V&V RECOMMENDATIONS"/>
</xs:extension>
</xs:simpleContent>
</xs:complexType>
</xs:element>
<xs:element name="KeyParticipants">
<xs:annotation>
<xs:documentation><![CDATA[Identifies the
participants involved in the VV&A effort as well as the roles that they are assigned and their key
responsibilities within that role. Roles and key responsibilities are defined during initial planning; names
and contact information of the actual participants are added when they are determined. For each person
serving as a Subject Matter Expert (SME), include a listing of the person's
qualifications.]]></xs:documentation>
</xs:annotation>
<xs:complexType>
<xs:sequence>
<xs:element name="TextEntry"
type="TextEntryType"/>
</xs:sequence>
</xs:complexType>
</xs:element>
<xs:element
name="AccreditationParticipants">
<xs:annotation>
<xs:documentation><![CDATA[Identifies the participants involved in the accreditation effort,
including their contact information, assigned role, and the key responsibilities associated with that role.
Typical accreditation roles include Accreditation Authority, Accreditation Agent, Accreditation Team, and
Subject Matter Experts (SMEs).]]></xs:documentation>
</xs:annotation>
<xs:complexType>
<xs:complexContent>
<xs:extension
base="ParticipantsType">

```

```

    <xs:attribute name="heading" type="xs:string" use="optional" default="Accreditation
Participants"/>
    </xs:extension>
    </xs:complexContent>
    </xs:complexType>
  </xs:element>
  <xs:element name="VVParticipants">
    <xs:annotation>
      <xs:documentation><![CDATA[Lists the participants involved in the V&V effort, including their
contact information, assigned role, and the key responsibilities associated with that role. Typical V&V roles
include M&S Proponent, V&V Agent, V&V Team, Validation Authority, Data Source, and
SMEs.]]></xs:documentation>
    </xs:annotation>
    <xs:complexType>
      <xs:complexContent>
        <xs:extension
base="ParticipantsType">
          <xs:attribute name="heading" type="xs:string" use="optional" default="V&V Participants"/>
            </xs:extension>
            </xs:complexContent>
            </xs:complexType>
          </xs:element>
          <xs:element name="OtherParticipants">
            <xs:annotation>
              <xs:documentation><![CDATA[Identifies the members of the application program and model
development effort with V&V or accreditation responsibilities as well as others who have a role in the
VV&A process. The information should include their position or role, contact information, and VV&A
responsibilities. Typical roles include M&S Program Manager, M&S Application Sponsor, M&S User,
M&S Developer, Data Source, Milestone Decision Authority, Program Office, M&S Development Team,
User Group, Configuration Control Board, and SMEs.]]></xs:documentation>
            </xs:annotation>
            <xs:complexType>
              <xs:complexContent>
                <xs:extension
base="ParticipantsType">
                  <xs:attribute name="heading" type="xs:string" use="optional" default="Other Participants"/>
                    </xs:extension>
                    </xs:complexContent>
                    </xs:complexType>
                  </xs:element>
                </xs:sequence>
                <xs:attribute name="heading" type="xs:string"
use="optional" default="KEY PARTICIPANTS"/>
                  </xs:complexType>
                </xs:element>
                <xs:element name="ActualVVRResourcesExpended">
                  <xs:annotation>
                    <xs:documentation><![CDATA[Discusses the
resources expended during execution of the V&V Plan, such as performers, man-hours, materials, and

```

funding. This information provides a mechanism to identify the impact of resource gaps on the current application and to scope resource requirements for future applications.]]></xs:documentation>

```

</xs:annotation>
<xs:complexType>
  <xs:sequence>
    <xs:element name="TextEntry"
type="TextEntryType"/>
  </xs:sequence>
</xs:complexType>
</xs:element>
</xs:annotation>
<xs:documentation><![CDATA[Identifies the resources that were expended to accomplish the
V&V activities. The information should include the activity, task, or event; assigned performer; and the list
of required resources (e.g., SMEs, equipment, and TDY funding). A gap analysis should be conducted that
compares the required resources as identified in the V&V Plan to the resources expended to determine if a
shortfall existed and, as a result, what information needed to support the accreditation assessment was not
produced.]]></xs:documentation>
</xs:annotation>
<xs:complexType>
  <xs:simpleContent>
    <xs:extension
base="xs:string">
      <xs:attribute name="heading" type="xs:string" use="optional" default="V&V Resources
Expended"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
</xs:element>
</xs:element>
name="ActualVVMilestonesAndTimeline">
  <xs:annotation>
    <xs:documentation><![CDATA[Provides a chart of when the V&V milestones were achieved
within the context of the overall program timeline.]]></xs:documentation>
  </xs:annotation>
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension
base="xs:string">
        <xs:attribute name="heading" type="xs:string" use="optional" default="Actual V&V
Milestones and Timeline"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
</xs:sequence>
  <xs:attribute name="heading" type="xs:string"
use="optional" default="ACTUAL V&V RESOURCES EXPENDED"/>
</xs:complexType>
</xs:element>
<xs:element name="VVLessonsLearned">
  <xs:annotation>

```

and fulfillment of any successful and streamlined process necessarily includes adjustments to its steps. This section provides a summary of the adjustments and lessons learned during the V&V implementation.]]></xs:documentation>

```

</xs:documentation><![CDATA[The development
and fulfillment of any successful and streamlined process necessarily includes adjustments to its steps. This
section provides a summary of the adjustments and lessons learned during the V&V
implementation.]]></xs:documentation>
</xs:annotation>
<xs:complexType>
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <xs:attribute name="heading"
type="xs:string" use="optional" default="V&amp;V LESSONS LEARNED"/>
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>
</xs:element>
<xs:element name="MSDescription" type="MSDescriptionType"/>
<!-- in conjunction with DDMS, look in MS COI DMS for description
of M&S resources-->
<xs:element name="MSDescription" type="MSDescriptionType">
  <xs:annotation>
    <xs:documentation><![CDATA[Provides pertinent
detailed information about the M&S being assessed.]]></xs:documentation>
  </xs:annotation>
  <!-- in conjunction with DDMS, look in MS COI DMS for
description of M&S resources-->
</xs:element>
<xs:element name="MSRequirementsTraceability"
type="MSRequirementsTraceabilityType">
  <xs:annotation>
    <xs:documentation><![CDATA[Establishes the links
between the M&S requirements, the acceptability criteria, and the evidence collected during the V&V
processes. The traceability matrix provides a visual representation of the chain of information that evolves
as the VV&A processes are implemented. As implementation progresses from the planning to reporting
phases, the traceability matrix assists in the identification of information gaps that may result from VV&A
activities not performed, not addressed, or not funded. The document section contains text and an optional
traceability table.]]></xs:documentation>
  </xs:annotation>
</xs:element>
<xs:element name="BasisOfComparison"
type="BasisOfComparisonType"/>
<xs:element name="References" type="ReferencesType"/>
<xs:element name="Acronyms" type="AcronymsType"/>
<xs:element name="Glossary" type="GlossaryType"/>
<xs:element name="VVProgrammatics">
  <xs:complexType>
    <xs:complexContent>
      <xs:extension base="ProgrammaticsType">
        <xs:attribute name="heading"
type="xs:string" use="optional" default="V&amp;V PROGRAMMATICS"/>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>
</xs:element>
<xs:element name="DistributionList" type="DistributionListType"/>
<xs:element name="VVPlanReference">
  <xs:annotation>

```

```

                                <xs:documentation><![CDATA[Provides a copy of
or a reference to the V&V Plan in its most current iteration.]]></xs:documentation>
                                </xs:annotation>
                                <xs:complexType>
                                    <xs:complexContent>
                                        <xs:extension
base="PriorDocumentAppendixType">
                                                <xs:attribute name="heading"
type="xs:string" use="optional" default="V&amp;V PLAN"/>
                                        </xs:extension>
                                    </xs:complexContent>
                                </xs:complexType>
                            </xs:element>
                            <xs:element name="TestInformation">
                                <xs:annotation>
                                    <xs:documentation><![CDATA[Information on
scenarios, data, setup, etc.]]></xs:documentation>
                                </xs:annotation>
                                <xs:complexType>
                                    <xs:simpleContent>
                                        <xs:extension base="xs:string">
                                            <xs:attribute name="heading"
type="xs:string" use="optional" default="TEST INFORMATION"/>
                                        </xs:extension>
                                    </xs:simpleContent>
                                </xs:complexType>
                            </xs:element>
                        </xs:sequence>
                    </xs:complexType>
                </xs:element>
</xs:schema>

```

B.4 Accreditation Report XML Schema

```

<?xml version="1.0" encoding="UTF-8"?>
<!-- edited with XMLSpy v2008 (http://www.altova.com) by Curtis Blais (Naval Postgraduate School) -->
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns="http://metadata.dod.mil/mdr/ns/VVADocumentation/1.0"
targetNamespace="http://metadata.dod.mil/mdr/ns/VVADocumentation/1.0"
elementFormDefault="qualified" attributeFormDefault="unqualified" version="0.40">
    <xs:annotation>

```

<xs:documentation><![CDATA[
 This XML Schema file describes standard content for an Accreditation Report in accordance with reference [1]. Where applicable, complex and simple data types from schemas for DoD discovery metadata [2] and M&S Community of Interest discovery metadata [3] are referenced.

[1] Department of Defense Standard Practice: Documentation of Verification, Validation and Accreditation (VV&A) for Models and Simulations, MIL-STD-3022, 28 January 2008. This standard establishes templates for the four core products of the M&S VV&A processes. The templates provide a common framework and interfacing capability between the four documents and support consistency and efficiency.

[2] Department of Defense: Department of Defense Discovery Metadata Specification (DDMS), Version 1.4.1, dated 10 August 2007.

[3] Modeling & Simulation Coordination Office: Modeling & Simulation Community of Interest Discovery Metadata Specification, document version 1.0.1 dated 1/22/2008 and schemas version 1.0.2 dated 4/29/2008 and 5/21/2008.

```

]]></xs:documentation>
<xs:documentation><![CDATA[
Change Log:
Author
Change
Date

]]></xs:documentation>
</xs:annotation>
<!-- Include the VVA Documentation Base Types schema -->
<xs:include schemaLocation="VVADocumentationBaseTypesV0.40.xsd"/>
<!-- Define Accreditation Report Content -->
<xs:element name="AccreditationReport">
  <xs:annotation>
    <xs:documentation>Standard content of an Accreditation Report. The
    Accreditation Report documents the results of the accreditation assessment; documents recommendations
    in support of the accreditation decision; and documents lessons learned during
    accreditation.</xs:documentation>
  </xs:annotation>
  <xs:complexType>
    <xs:sequence>
      <xs:element name="ProjectReferenceID"
type="ProjectReferenceIDType">
        <xs:annotation>
          <xs:documentation>Reference to the project
          identifier automatically entered in the document file by the DVDT software. This reference does not appear
          in the content of the VV&A document.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="DocumentReferenceID"
type="DocumentReferenceIDType">
        <xs:annotation>
          <xs:documentation>Document identifier
          automatically assigned to this document by the DVDT software. This identifier does not appear in the
          content of the VV&A document.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="AccreditationReportTitlePage"
type="DocumentTitlePageType">
        <xs:annotation>
          <xs:documentation>Title page information for the
          document.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="RecordOfChanges"
type="RecordOfChangesType">
        <xs:annotation>
          <xs:documentation>Record of changes made to
          versions of the document.</xs:documentation>
        </xs:annotation>
      </xs:element>
      <xs:element name="AccreditationReportExecutiveSummary">
        <xs:annotation>
          <xs:documentation><![CDATA[Provides an
          overview of the Accreditation Report. It should be a synopsis of the major elements from all sections of the
          document, with emphasis on accreditation scope, accreditation assessment, and accreditation
          recommendations.]]></xs:documentation>

```

```

        </xs:annotation>
        <xs:complexType>
            <xs:simpleContent>
                <xs:extension base="xs:string">
                    <xs:attribute name="heading"
type="xs:string" use="optional" default="ACCREDITATION REPORT EXECUTIVE SUMMARY"/>
                </xs:extension>
            </xs:simpleContent>
        </xs:complexType>
    </xs:element>
    <xs:element name="ProblemStatement"
type="ProblemStatementType">
        <xs:annotation>
            <xs:documentation><![CDATA[Describes the
problem the M&S is expected to address. The problem statement serves as the foundation for the definition
of requirements, acceptability criteria, and ultimately the accreditation assessment by documenting (1) the
question(s) to be answered an/or the particular aspects of the problem that the M&S will be used to help
address; (2) the decisions that will be made based on the M&S results; (3) the consequences resulting from
erroneous M&S outputs.]]></xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="MSRequirementsAcceptability"
type="MSRequirementsAcceptabilityType">
        <xs:annotation>
            <xs:documentation><![CDATA[Describes the M&S
requirements defined for the intended use, the derived acceptability criteria that must be met to satisfy the
requirements, the quantitative and qualitative metrics used to measure their success, and the order of their
priority.]]></xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element
name="MSAssumptionsCapabilitiesLimitationsRisksImpacts" type="MSCharacterizationType">
        <xs:annotation>
            <xs:documentation><![CDATA[Describes factors
that constrain the development and/or use of the M&S or that impede the VV&A effort, including the
assumptions, capabilities, limitations, and risk factors affecting M&S development and risks associated
with using the M&S for the intended use.]]></xs:documentation>
        </xs:annotation>
    </xs:element>
    <xs:element name="AccreditationAssessment">
        <xs:annotation>
            <xs:documentation><![CDATA[Describes the
methods used in the accreditation assessment.]]></xs:documentation>
        </xs:annotation>
        <xs:complexType>
            <xs:sequence>
                <xs:element name="TextEntry"
type="TextEntryType"/>
            </xs:sequence>
        </xs:complexType>
    </xs:element>
    <xs:element name="AccreditationInformationUsed">
        <xs:annotation>
            <xs:documentation><![CDATA[Describes the information used to conduct the accreditation
assessment. It should map to the Accreditation Information Needs subsection of the Accreditation
Plan.]]></xs:documentation>

```

```

        </xs:annotation>
        <xs:complexType>
            <xs:sequence>
                <xs:element
name="TextEntry" type="TextEntryType"/>
                <xs:element
name="InformationUsedList" minOccurs="0">
                    <xs:complexType>
                        <xs:sequence>
                            <xs:element name="InformationUsedItem" type="InformationUsedItemType"
maxOccurs="unbounded"/>
                        </xs:sequence>
                    </xs:complexType>
                </xs:element>
            </xs:sequence>
            <xs:attribute
name="heading" type="xs:string" use="optional" default="Accreditation Information Used"/>
        </xs:complexType>
    </xs:element>
    <xs:element
name="InformationCollection">
        <xs:annotation>
            <xs:documentation>Describes how, when, and from whom the information was obtained and
references the appendix, document, or archive where the actual information can be
found.</xs:documentation>
        </xs:annotation>
        <xs:complexType>
            <xs:sequence>
                <xs:element
name="TextEntry" type="TextEntryType"/>
                <xs:element
name="InformationCollectionList" minOccurs="0">
                    <xs:complexType>
                        <xs:sequence>
                            <xs:element name="InformationCollectionItem" type="InformationCollectionItemType"
maxOccurs="unbounded"/>
                        </xs:sequence>
                    </xs:complexType>
                </xs:element>
            </xs:sequence>
            <xs:attribute
name="heading" type="xs:string" use="optional" default="Information Collection"/>
        </xs:complexType>
    </xs:element>

```

```

<xs:element name="Assessment">
  <xs:annotation>
    <xs:documentation><![CDATA[Describes the assessment events, including the assessment
    techniques used, participants involved, milestones achieved, and results of the assessment events. The
    assessment focuses on the evidence documented in the V&V Reoport and how well that evidence addresses
    the acceptability criteria documented in the Accreditation Plan. This assessment forms the basis for the
    accreditation recommendations. The relationship of the accreditation assessment findings to the V&V
    evidence is recorded in the Requirements Traceability Matrix.]]></xs:documentation>
  </xs:annotation>
  <xs:complexType>
    <xs:sequence>
      <xs:element
name="TextEntry" type="TextEntryType"/>
      <xs:element
name="AssessmentList" minOccurs="0">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="AssessmentItem" type="AssessmentItemType" maxOccurs="unbounded"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
    </xs:sequence>
    <xs:attribute
name="heading" type="xs:string" use="optional" default="Assessment"/>
  </xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="heading" type="xs:string"
use="optional" default="ACCREDITATION ASSESSMENT"/>
</xs:complexType>
</xs:element>
<xs:element name="AccreditationRecommendations">
  <xs:annotation>
    <xs:documentation><![CDATA[Describes the
    accreditation recommendations to be forwarded to the Accreditation Authority and provides the rationale
    for each.]]></xs:documentation>
  </xs:annotation>
  <xs:complexType>
    <xs:simpleContent>
      <xs:extension base="xs:string">
        <xs:attribute name="heading"
type="xs:string" use="optional" default="ACCREDITATION RECOMMENDATIONS"/>
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>
</xs:element>
<xs:element name="KeyParticipants">
  <xs:annotation>

```

<xs:documentation><![CDATA[Identifies the participants involved in the VV&A effort as well as the roles that they are assigned and their key responsibilities within that role. Roles and key responsibilities are defined during initial planning; names and contact information of the actual participants are added when they are determined. For each person serving as a Subject Matter Expert (SME), include a listing of the person's qualifications.]]></xs:documentation>

```

</xs:annotation>
<xs:complexType>
  <xs:sequence>
    <xs:element name="TextEntry"
type="TextEntryType"/>
  </xs:sequence>
</xs:complexType>
</xs:annotation>
<xs:element
name="AccreditationParticipants">
  <xs:annotation>

```

<xs:documentation><![CDATA[Identifies the participants involved in the accreditation effort, including their contact information, assigned role, and the key responsibilities associated with that role. Typical accreditation roles include Accreditation Authority, Accreditation Agent, Accreditation Team, and Subject Matter Experts (SMEs).]]></xs:documentation>

```

</xs:annotation>
<xs:complexType>
  <xs:complexContent>
    <xs:extension
base="ParticipantsType">
  <xs:attribute name="heading" type="xs:string" use="optional" default="Accreditation
Participants"/>

```

```

    </xs:extension>
  </xs:complexContent>
</xs:complexType>
</xs:element>
<xs:element name="VVParticipants">
  <xs:annotation>

```

<xs:documentation><![CDATA[Lists the participants involved in the V&V effort, including their contact information, assigned role, and the key responsibilities associated with that role. Typical V&V roles include M&S Proponent, V&V Agent, V&V Team, Validation Authority, SMEs, and Data Source.]]></xs:documentation>

```

</xs:annotation>
<xs:complexType>
  <xs:complexContent>
    <xs:extension
base="ParticipantsType">

```

```

  <xs:attribute name="heading" type="xs:string" use="optional" default="V&V Participants"/>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>
</xs:element>
<xs:element name="OtherParticipants">
  <xs:annotation>

```

<xs:documentation><![CDATA[Identifies the members of the application program and model development effort with V&V or accreditation responsibilities as well as others who have a role in the VV&A process. The information should include their position or role, contact information, and VV&A


```

<xs:documentation><![CDATA[Provides a chart of when the accreditation milestones were
achieved within the context of the overall program timeline.]]></xs:documentation>
    </xs:annotation>
    <xs:complexType>
        <xs:simpleContent>
            <xs:extension
base="xs:string">
                </xs:extension>
            </xs:simpleContent>
        </xs:complexType>
    </xs:element>
</xs:sequence>
    <xs:attribute name="header" type="xs:string"
use="optional" default="ACTUAL ACCREDITATION RESOURCES EXPENDED"/>
    </xs:complexType>
</xs:element>
    <xs:element name="AccreditationLessonsLearned">
        <xs:annotation>
            <xs:documentation><![CDATA[The development
and fulfillment of any successful and streamlined process necessarily includes adjustments to its steps. This
section provides a summary of the adjustments and lessons learned during the V&V
implementation.]]></xs:documentation>
        </xs:annotation>
        <xs:complexType>
            <xs:simpleContent>
                <xs:extension base="xs:string">
                    <xs:attribute name="heading"
type="xs:string" use="optional" default="ACCREDITATION LESSONS LEARNED"/>
                </xs:extension>
            </xs:simpleContent>
        </xs:complexType>
    </xs:element>
    <xs:element name="MSDescription" type="MSDescriptionType"/>
    <!-- in conjunction with DDMS, look in MS COI DMS for description
of M&S resources-->
    <xs:element name="MSRequirementsTraceability"
type="MSRequirementsTraceabilityType">
        <xs:annotation>
            <xs:documentation><![CDATA[Establishes the links
between the M&S requirements, the acceptability criteria, and the evidence collected during the V&V
processes. The traceability matrix provides a visual representation of the chain of information that evolves
as the VV&A processes are implemented. As implementation progresses from the planning to reporting
phases, the traceability matrix assists in the identification of information gaps that may result from VV&A
activities not performed, not addressed, or not funded. The document section contains text and an optional
traceability table.]]></xs:documentation>
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    <xs:element name="Acronyms" type="AcronymsType"/>

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to the Accreditation Plan in its most current iteration.</xs:documentation>
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or a reference to the V&V report in its most current iteration.]]></xs:documentation>
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